

Archives of **PHYSICAL MEDICINE and REHABILITATION**

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Editor of the Month
FREDERIC J. KOTTKE, M.D.
Minneapolis

**3rd International Congress of Physical Medicine
and**

**8th Annual Session • American Congress of Physical Medicine and Rehabilitation
Mayflower Hotel, Washington, D. C. • August 21-26, 1960**

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The following rules and regulations apply to the contest:

1. This competition is open to all persons except Members of the Boards of Governors of the American Congress of Physical Medicine and Rehabilitation, American Academy of Physical Medicine and Rehabilitation and the Program Committee of the 3rd International Congress of Physical Medicine.
2. Manuscripts must be in the office of the American Congress of Physical Medicine and Rehabilitation, 30 N. Michigan Ave., Chicago 2, Ill., not later than May 2, 1960. This deadline will be rigidly maintained.
3. The essay must not have been published previously.
4. Essays will be judged on original work, contribution to knowledge of this subject and clear exposition of the facts. Contributions should not exceed 6000 words (exclusive of headings, references, legends for illustrations, tables, etc.) and the number of words should be stated on the title page. Seven copies of the manuscript must be submitted — two original copies and five carbon copies. No papers will be returned.
5. The winning contribution will be determined by the Program Committee of the 3rd International Congress of Physical Medicine.
6. All contributions will become the property of the American Congress of Physical Medicine and Rehabilitation and will be released to the ARCHIVES OF PHYSICAL MEDICINE AND REHABILITATION for publication as determined by its Editorial Board.
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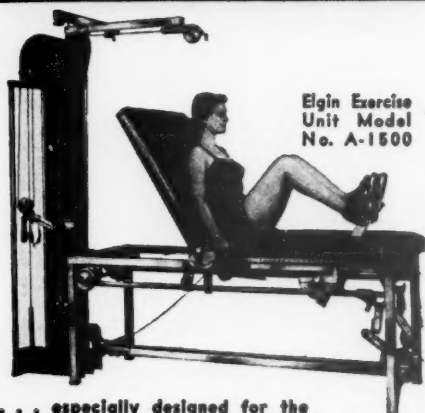
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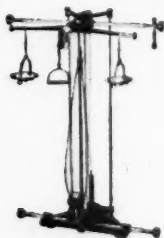


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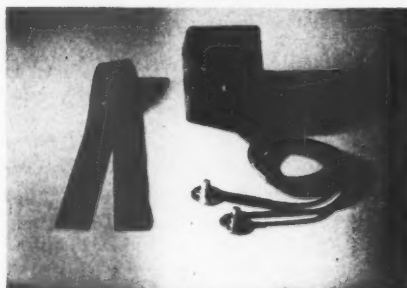
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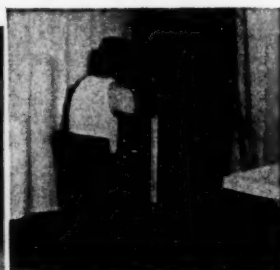
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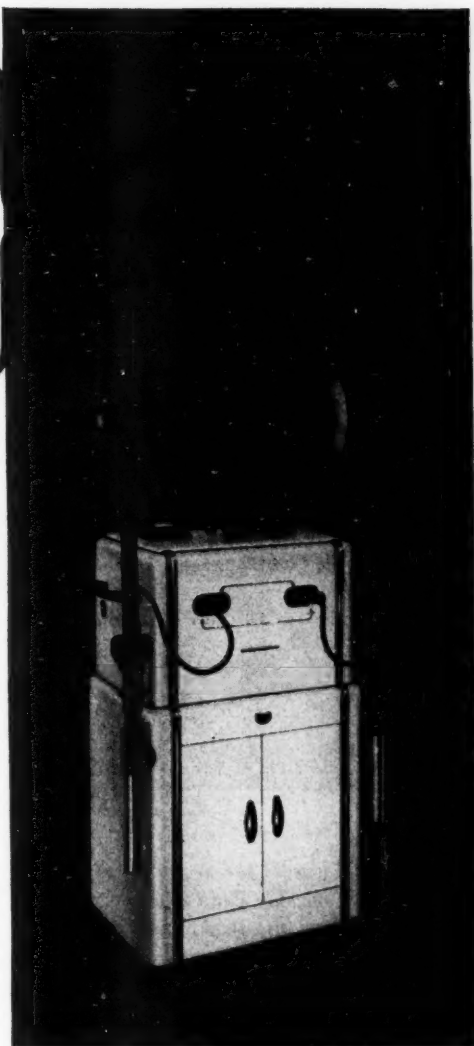
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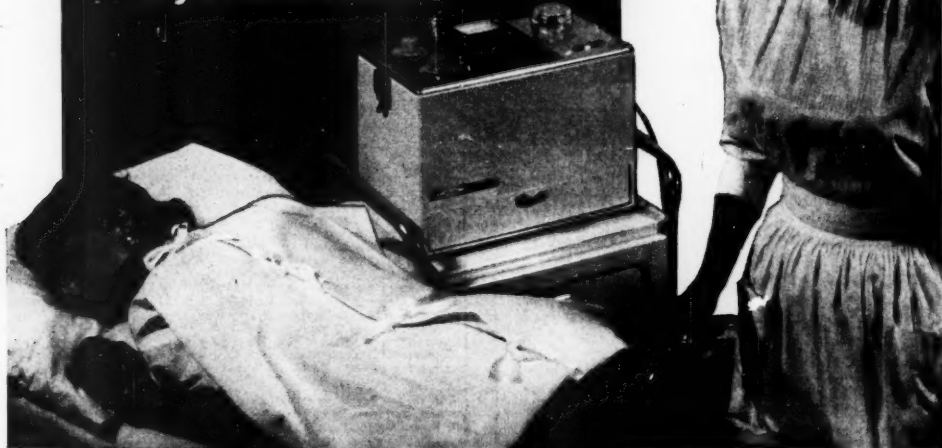
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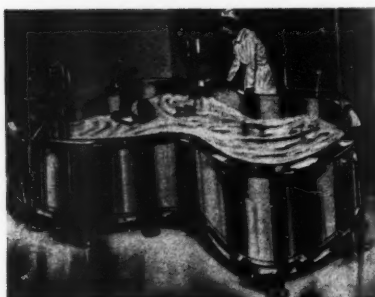
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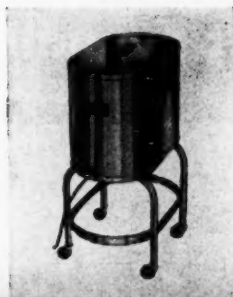


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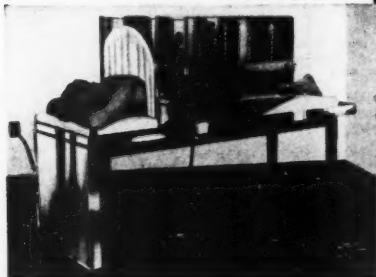
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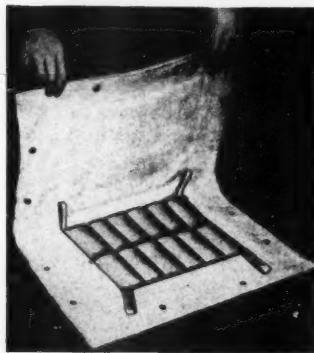
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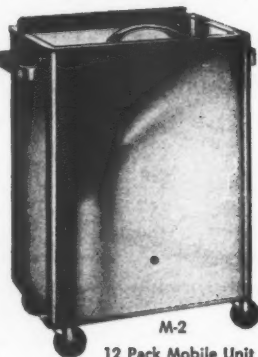


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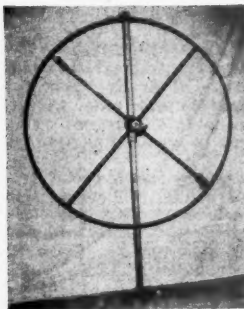
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Measurement of Energy Expenditure During Ambulation, with Special Reference to Evaluation of Assistive Devices

Gregory Bard, M.D.
and
H. J. Ralston, Ph.D.
San Francisco

● A method is described for presenting the results of energy measurements in the ambulation of both normal and disabled subjects. It is shown that the energy curves calculated as calories per meter walked per kilogram of body weight are a most instructive form for presentation of energy data, and may be used for comparing one subject with another, or for comparing the performances of the same subject using a variety of types of assistive devices. Illustrative examples drawn from normal subjects, above-knee amputees, and hemiplegics are provided and discussed.

During recent years the literature on physiology and rehabilitation has reflected an increasing interest in the study of the metabolic requirements of both normal and disabled human subjects engaging in a variety of types of physical activity. Among such studies may be mentioned those dealing with poliomyelitis patients,¹ amputees,²⁻⁵ paraplegics,⁵⁻⁷ and normal subjects.^{8,9} In view of the continually increasing average age of our population, medical and social problems relating to the physically handicapped members of our society may be expected to demand even greater attention in the years to come. In particular, it has become necessary to establish objective criteria for evaluation of these problems.

It is the purpose of this paper to discuss certain experimental and graphical procedures which have been found to be of value in describing the energy demands of ambulation in normal and handicapped human subjects. Average values of energy expenditure of normal subjects walking at various speeds are provided, with which other values may be compared. In the course of this study, special consideration has been given to the energy expenditure involved in the gait of hemiplegic and amputee subjects.

Methods

A track 24.4 meters in length and octagonal in shape is laid out upon the floor of our laboratory. A given subject may engage either in a paced walk or in

an unpaced walk, depending upon the requirements of the particular experiment. As nearly as possible, energy measurements are made upon subjects who are "stabilized" in their activity. This simply means that they have exercised at the test rate for a period of about 5 minutes before measurements are made. When a preliminary warm-up period is not feasible, the subject is studied for a period of about 10 minutes after the exercise in order to determine whether or not an appreciable oxygen debt has been incurred. If so, this debt is added to the energy expenditure measured during the exercise.

Measurements of pulmonary ventilation and collection of expired air for subsequent analysis are made with the respirometer developed at the Max Planck Institute in Germany. This device weighs only 3.5 kg. and, except by severely disabled patients, may be worn on the back like a knapsack (fig. 1). The meter is carried by a laboratory assistant when carrying even so small a load is difficult for the patient. The volume of air exhaled by a subject during a given length of time is directly recorded by a counter, and a certain fraction of the expired air is collected in a rubber bag and analyzed in a Beckman-Pauling oxygen analyzer. From such measurements the energy expenditure may be calculated. It is our custom to express energy expenditures in terms of calories per minute per kilogram of body weight, or else, as will be described subsequently,

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This investigation was supported in part by research grant 4856(C) from the National Institutes of Health, Public Health Service; by research grant SP-165 from the Office of Vocational Rehabilitation, Department of Health, Education and Welfare, and by contract VAM-28110 from the Veterans Administration.



Fig. 1—Hemiplegic patient with Max Planck-type respirometer used in energy studies.

in calories per meter per kilogram of body weight.

Our laboratory is equipped with a large, frictionless, revolving boom designed to carry leads from the patient to the recording apparatus in an adjacent room. Electrocardiograms are routinely recorded during experiments, both for study of the cardiac effects of exercise and for protection of the patient against possibly injurious effects of exercise. The electrocardiogram is continuously monitored on an oscilloscope and recorded with a pen-writer. Any other type of physiological variable, such as respiratory rate or electromyogram, may be similarly recorded while the subject is walking around the track.

Presentation and Analysis of Data

Energy Expenditure of Normal Subjects during Ambulation. In figure 2, the heavy curve shows the relationship between stabilized energy expenditure in calories per minute per kilogram of body

weight and walking speed in meters per minute for normal adult subjects. The curve is based upon average values for 12 males and 7 females studied in our laboratory, plus a large number of cases collected from the literature. In a recent paper⁹ it has been shown that this curve may be accurately represented by the relation:

$$\text{cal./min./kg.} = 29 + 0.0053v^2$$

where v is the speed in meters per minute.

The standard deviations for the average values on which the heavy curve of figure 2 is based are represented by the shaded area and are of the order of 10 per cent of the average value; that is, 67 per cent of all subjects may be expected to fall within ± 10 per cent of the values read from the curve, and 95 per cent of all subjects to fall within ± 20 per cent of the values. Table 1 provides values of the energy expenditure for a convenient range of speeds.

For certain purposes, there is another way of expressing energy expenditure as a function of speed which is more instructive than the curve of figure 2. This is to express the energy expenditure as calories per meter walked per kilogram of body weight. The mathematical relation is:

$$\frac{\text{cal./min./kg.}}{\text{speed in meters/min.}} = \frac{29}{v} + 0.0053 v.$$

This is plotted in figure 3 (heavy curve). The shaded area represents \pm

Table 1: Energy Expenditures in Normal Subjects*

Meters/Min.	Cal./Min./Kg.	Cal./Meter/Kg.
Standing quietly	20 \pm 2	—
25	32 \pm 3	1.28 \pm 0.13
50	42 \pm 4	0.84 \pm 0.08
75	59 \pm 6	0.79 \pm 0.08
100	82 \pm 8	0.82 \pm 0.08
125	112 \pm 11	0.90 \pm 0.09

*Values are expressed as calories per minute per kilogram of body weight and as calories per meter per kilogram of body weight, for a variety of walking speeds in meters per minute. Approximate standard deviations are given as \pm values.

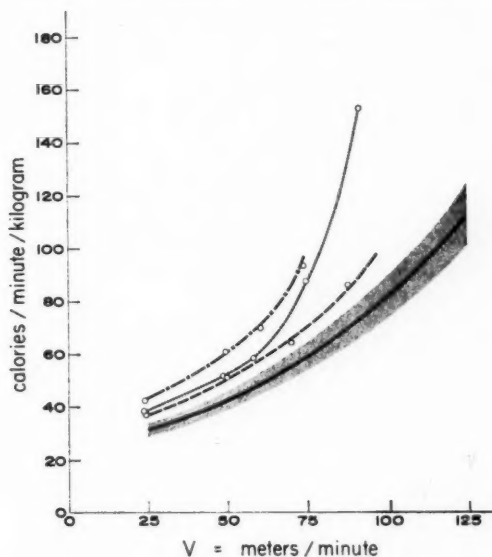


Fig. 2 — Heavy curve: average energy expenditure in cal./min./kg. of normal subjects walking at various speeds. Stippled area: approximately one standard deviation. Broken line: amputee walking with suction-socket prosthesis. Dotted line: same, using pylon. x-x-x: same, using forearm crutches.

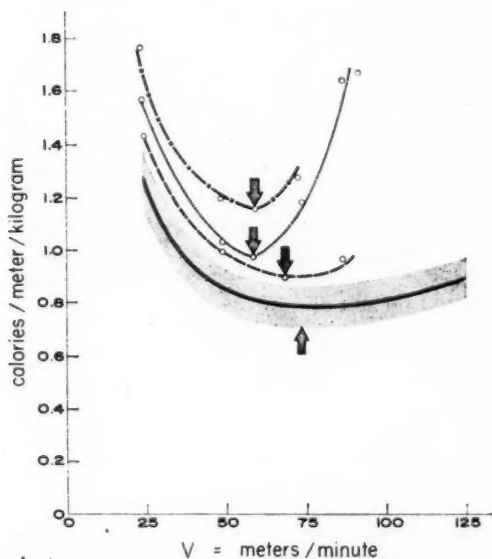


Fig. 3 — Heavy curve: average energy expenditure in cal./meter/kg. of normal subjects walking at various speeds. Stippled area: approximately one standard deviation. The broken, dotted, and x-x-x lines have the significance described in the legend to figure 2. Arrows represent natural walking speeds.

one standard deviation, or ± 10 per cent. It has been shown⁹ that this curve is a hyperbola. The curve starts out with a high figure for energy expenditure at low speeds of walking, comes down through a minimal value for some optimal speed, and then increases again as the walking speed goes beyond the optimal. For any subject walking at a variety of speeds it is found that the energy expenditure expressed as calories per meter per kilogram of body weight passes through a minimal point which is unique for that particular subject. This unique point provides a means of comparing the energy expenditures of the same subject under a variety of conditions, or of comparing a normal subject with a handicapped subject.

It is found that the optimal speed of walking represents also a "natural" or "comfortable" speed; that is to say, a given subject, when allowed to walk at a speed that is natural or comfortable for him, will adopt a speed that is very nearly equal to that at which minimal energy expenditure occurs.

Table 1 provides normal average values of the energy expenditure in calories per meter per kilogram of body weight for a variety of convenient speeds.

Energy Expenditure of Above-Knee Amputees during Ambulation. We have studied 6 above-knee amputees, with a view to determining, first, how their energy expenditures in ambulating with their usual assistive devices compare with those of normal subjects, and second, how changing the nature of the assistive device alters their performance. We shall describe here the results on a single subject, J.B., but the conclusions drawn from these results hold also for the other subjects.

J.B. is a skillful walker with a variety of types of prostheses, including pylon and forearm crutches. He was first studied wearing a suction-socket prosthesis, U.C. hydraulic swing-phase-control single-axis knee, with SACH (Solid Ankle-Cushion Heel) foot. In figure 2, the broken line shows the energy expenditure of J.B. in calories per minute per kilogram of body weight in walking at various speeds with this prosthesis. It is

seen that the energy expenditure exceeds the normal figure at every speed, but is not excessively great. At 74 meters per minute, the average normal "natural" speed, J.B.'s energy expenditure is only about 20 per cent above the normal average.

The dotted line in figure 2 shows the energy expenditure of J.B. when using a pylon instead of his usual prosthesis. For low speeds, the curve is not greatly different from the preceding curve, although the natural walking speed is distinctly lower. At speeds above about 60 meters per minute, the energy expenditure begins to climb sharply.

The top curve of figure 2 shows the performance of J.B. when using forearm crutches. The energy expenditure is greater at every speed than with the other assistive devices.

In all of our subjects it has been found that crutch-walking is very costly, metabolically speaking, compared to walking with other assistive devices. We believe that putting a person on crutches may be hazardous because of the excessive work burden imposed upon the subject. This is particularly true of the older age groups or of patients having a cardiovascular history.

In figure 3 the energy expenditures of the same experiments have been plotted as calories per meter per kilogram of body weight. The arrows mark natural walking speeds. These curves are more instructive than those of figure 2, because they show at once the drift of the natural walking speed to lower speeds, and the rise in the energy expenditure at the minimal (optimal) point of each curve. In general, it may be said that as the energy expenditure becomes less economical, the optimal point drifts upward and to the left.

For J.B., the optimal energy expenditure with crutches is 30 per cent greater than with the usual prosthesis, while at the same time the optimal walking speed is 20 per cent less.

Energy Expenditure of Hemiplegics during Ambulation. In the preceding cases it was possible to plot out fairly complete energy curves, because of the ability of the subjects to ambulate with

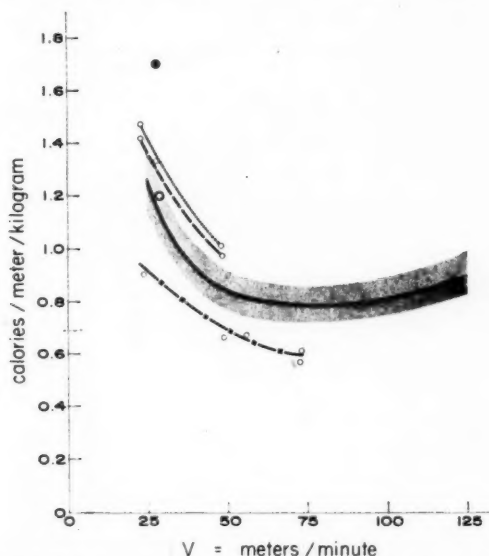


Fig. 4—Heavy curve and stippled area: same significance as in figure 3. x—x—x: hemiplegic patient B.C., walking unassisted. Open circle: hemiplegic patient L.S., walking with cane and brace. Solid circle: same patient, walking with cane only. Broken curve: hemiplegic patient A.B., walking with cane. Dotted curve: same patient, without cane.

various assistive devices over a fairly wide range of speeds. For many patients, such as hemiplegics, however, the range of speeds possible is severely restricted, so that complete energy curves cannot be so readily (or safely) obtained. Nevertheless, interesting exceptions occur.

Figure 4 shows the normal curve and standard deviation for energy expenditure in calories per meter per kilogram of body weight as described for figure 3. The lower curve shows the energy expenditure of patient B.C., a 55-year-old female telephone operator who in 1956 suffered a cerebral vascular accident affecting her right side. During the following two years she showed considerable return of function, although some spasticity remained on the involved side. In spite of her handicap, however, her energy curve actually underlies the normal for speeds up to about 73 meters per minute. Clearly, from an energy standpoint, it would not be economically or medically justifiable to spend time trying to improve the walking performance of this patient.

At the other extreme is L.S. Hemiparesis developed in this 68-year-old pa-

tient in 1956, as the result of an auto accident. Since then he has been partially paralyzed on the right side, with no neurological change. At present he is in excellent health except for a moderate amount of spasticity and weakness in the right arm and leg. He has a typical hemiplegic gait with the foot in equinovarus position and with most of the weight bearing on the normal left leg.

L.S. is sharply restricted in speed of walking, not being able to exceed about 28 meters per minute. The open circle in figure 4 shows his energy expenditure at 28 meters per minute, when walking with cane and brace. The value 1.20 falls within normal limits. When walking with cane but without brace, at the same speed, as shown by the solid circle in figure 4, L.S.'s energy expenditure was 1.70, or 41 per cent greater than with brace and cane. Here is quantitative evidence of the value of the brace in saving the patient a great work burden.

Finally, in figure 4 are plotted energy curves for patient A.B., a 45-year-old machinist who suffered a left hemiplegia in 1957 while on a hunting trip. At the time of our study he had reached a

plateau of improvement, with residual weakness in the leg and arm, but could ambulate without support or assistive device, although he usually used a cane. The broken line shows his energy expenditure for speeds up to about 49 meters per minute, using a cane, and the dotted line the energy for a similar range of speeds, but without cane. Although the difference in the two curves is slight, the use of the cane is justified from an energy-saving standpoint.

In the past, criteria used in gait training of handicapped individuals were based primarily on cosmetic patterns, with a tendency toward doing away with assistive devices. However, experimental studies of energy demands indicate the need for determining those devices which are the most economical from the viewpoint of energy expenditure, even at some sacrifice of the cosmetic aspect. Consideration of energy expenditures is also of critical importance in determining the physical therapy and occupational therapy technics to be used in the rehabilitation of the physically handicapped.

Summary

A method is described for presenting the results of energy measurements in the ambulation of both normal and disabled subjects. It is shown that the energy curves calculated as calories per meter walked per kilogram of body weight are a most instructive form for presentation of energy data, and may be used for comparing one subject with another, or

for comparing the performances of the same subject using a variety of types of assistive devices. Illustrative examples drawn from normal subjects, above-knee amputees, and hemiplegics are provided and discussed.

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"The hardest conviction to get into the mind of a beginner is that the education upon which he is engaged is not a college course, not a medical course, but a life course, for which the work of a few years under teachers is but a preparation."

— SIR WILLIAM OSLER

A Method for the Functional Evaluation of Disability

Jack Sokolow, M.D.
John E. Silson, M.D., M.P.H.
Eugene J. Taylor, M.A.
Edward T. Anderson, M.A.
and
Howard A. Rusk, M.D.
New York City

● The need for an objective method of evaluating disability has become more pressing with the advance of rehabilitation and the passage of legislation of the "disability freeze" type. With systems now in use, it is conceivable that a person might be considered disabled in one state and yet be rehabilitated and selectively placed in a job in another state. This project was undertaken to develop a uniform system of classifying the physical, emotional, social, and vocational capacities of disabled individuals functionally. A tentative classification system has thus been devised embracing the physical, social, emotional, and vocational spheres, and which permits broad application but also detailed expansion where desirable. Data from the forms are punched on I.B.M. cards. These forms have been pilot tested on 100 patients in various stages of rehabilitation at several institutions to determine inadequacies and necessary revisions.

In a preliminary report recently published,¹ the reasons for attempting to develop a method for functional disability evaluation, as well as the first tentative instrument developed for this purpose, were discussed.

Briefly, we have long felt that the development of rehabilitation programs and the passage of such legislation as the "disability freeze" provision in the Social Security law and the expansion of vocational rehabilitation have made clear the inadequacy of determining disability on the basis of anatomic loss or medical impairment alone.

While we do not gainsay the right of a person to be compensated for injury, our philosophy is that disability, as opposed to impairment, must be gauged on the basis of social, psychological, and vocational factors, as well as on medical factors. The determination must hinge on the person's ability to function in the home and at work, even if a new type of job is necessary. This definition of disability is accepted both in the medical profession and among such groups as insurance companies and vocational rehabilitation agencies.

For these reasons we attempted to develop an instrument which would permit a standard valid determination of disability from a functional point of view, and take into consideration medi-

cal, social, psychological, and vocational factors.

Early attempts at objective evaluation of disability such as the work of McBride,² the Canadian³ and U.S. Armies,⁴ Brown,⁵ and Lawton⁶ were reviewed. These represented evaluations for special purposes and were limited in their aims or were based essentially on medical impairment.

More recent efforts were those of Hoberman and Springer⁷ and of the staff of the Benjamin Rose Hospital⁸ in Ohio. Hoberman and Springer have attempted to develop objectivity in evaluating patients by devising a rating scale somewhat similar to the cardiac functional and therapeutic classification in structure. However, areas such as psychological and medical prognosis are not included.

The report from the Benjamin Rose Hospital was limited to aged persons with hip fractures and the methods developed for evaluating function were designed initially for this type of patient. Here various social and economic factors, as well as medical, are considered during the course of illness by staff members in contact with the patient and quantitative expressions of the course of illness are made in terms of proportion of patients deteriorating with respect to the factors

Read at the Thirty-Sixth Annual Session of the American Congress of Physical Medicine and Rehabilitation, Philadelphia, August 28, 1958.
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This project was made possible through a grant from the Office of Vocational Rehabilitation, Department of Health, Education, and Welfare, Washington, D. C.

under consideration. This study is for a specific group and vocational factors are omitted, probably because of the geriatric nature of the group.

Forms Used in Project

In the current project we have made use of procedures and tests that have been widely accepted and are standard for all practical purposes, such as manual muscle test and activities of daily living test. We have also added medical, social, psychological, vocational, and prognostic factors to these tests in the attempt to synthesize them into a form that would be objective and meaningful as well as practical to use (see table 1 and fig. 1).

These forms are coded for punching on an I.B.M. card of 80 columns, each containing 12 items. This constitutes the "master card" which contains the broad data probably applicable in the majority of cases. This card is so designed as to apply in every case where there is residual disability.

Where details not covered in the master card are desired, a "detail card"

may be drawn up, such as for details in activities of daily living, muscle, and range of motion tests. Detail cards may also be drawn up to cover specific types of disability—amputees, hemiplegics, and so forth.

Identification data are contained in columns 1-35 of the master card and are also to be found on all detail cards. Thus the forms for detail cards will begin with column 36. This system will make referral to general and detailed information simpler.

Columns 36-80 of the master card contain medical, social, psychological, vocational, and prognostic data. Due to limitations of space, arrangements and listings are often not in the most appropriate grouping. Further, nondisabling conditions were generally excluded and it should be definitely clear that these forms are not intended to replace the medical history and examination.

Instructions are on the forms. Color coding is used to guide the examiner. Thus, for areas not colored, each item that applies is checked. For areas colored red, only one item must be checked, and

Table 1: Summary of Data Assembled for Disability Evaluation Project*

IDENTIFICATION OF PATIENT:	Name, address, institution number, age, sex, race, physical type, date
STATEMENT OF DISABILITY:	Pain—moderate or severe, etiology of principal disability, organic system involved, degree of independence, motivation, financial resources, vocational and rehabilitation potential, living arrangements; per cent value
DIAGNOSIS:	Primary, secondary
INTERNAL MEDICINE:	Cardiac, vascular, pulmonary, gastrointestinal, endocrine, allergic, blood, poisoning, physical agents, skin, obesity, miscellaneous conditions; per cent value
SPECIAL SENSE:	Hearing, speech, sight; per cent value
GENITOURINARY SYSTEM:	Kidney and bladder, genital system; per cent value
NEUROMUSCULOSKELETAL:	Etiology, localization, specific defect—motor, musculoskeletal or sensory, special condition—paralysis, fracture, arthritis, epilepsy, etc.
MUSCLE TEST:	Major and minor side of involvement, extremity, specific muscle weakness
RANGE OF MOTION:	Major and minor side of involvement, extremity, specific joint limitation
ACTIVITIES OF DAILY LIVING:	Communication, level ambulation, wheelchair activities, bed activities, personal hygiene, dressing, eating, elevation, travel, appliance used, prosthesis; per cent value
SOCIOECONOMIC:	Economic resources, housing, family unit
PSYCHIATRIC:	Organic brain syndrome, psychoneurosis, aspirations, I. Q., ability to learn
VOCATIONAL:	Education, employment status
REHABILITATION POTENTIAL:	Medical prognosis, estimated maximum—length of time for rehabilitation, degree of independence estimated, future employment and living status

*If detailed 6-page form is desired, please direct request for this material to the author.

Red areas are: Column 19, X, Y, 7, 8, 9; Col. 21, 5, 6, 7, 8; Col. 22 all; Col. 45, X, Y, 0, 1; Col. 62-64 all; Col. 68 all; Col. 71, 3-9; Col. 73, 74, and 76 all; Col. 78, X, Y, 0, 1, 2, 3; Col. 79 all; muscle, range of motion, and activities of daily living detail cards, all.

Blue areas are: Col. 20, X, Y; Col. 36 all; Col. 47, X, Y, 0, 1, 2, 4, 5, 6; Col. 48, X, Y, 0, 1, 2; Col. 54, 7, 8, 9; Col. 55, X, Y, 0, 1, 2; Col. 57-60, all; Col. 65, X, Y, 0, 5, 6, 7, 8; Col. 69, 2, 3, 4; Col. 71, X, Y, 0; Col. 77, all; Col. 78, 4, 5, 6, 7, 8, 9.

for areas colored blue, only one item is chosen if the group is pertinent. If not, it is left blank. These colors are arranged in blocks which generally are intended to guide the examiner in filling out the form (table 1).

The column following each data group is to be used for percentage value and, based on the pilot test, criteria for determining percentage value are being worked out; a formula is planned to permit each factor to function in its relation to the others to achieve a single rating.

These forms constitute standard records that can be easily reproduced and sent to other institutions. Serial records permit thorough followup of the patient and it is planned to recheck the same patients as a test of reliability of the forms, their validity as a gauge of disability, and their prognostic ability.

Upon completion of the preliminary draft of these forms, a pilot test involving 124 patients was conducted at several institutions (Bellevue Hospital, Goldwater Memorial Hospital, Institute of Physical Medicine and Rehabilitation-New York University-Bellevue Medical Center) to determine practicability of use of the forms, necessary revisions, validity or objectivity of the forms, and statistics that could be obtained.

Test Procedure

Part I. From a given date, evaluation forms were applied to 45 consecutive admissions to the rehabilitation service. Patients who were brought in for evaluation and who were rejected were not included in the test.

After a 4-8 week period from the *date of admission of each of the patients selected* an evaluation form was applied to each such patient, thereby completing the test insofar as that patient was concerned.

If any of the 45 patients who were included in Part I of this test were discharged prior to two months from the date they were admitted, the evaluation form was applied to them at the point of discharge.

Part II. From the starting date of the test, evaluation forms were applied to 79 consecutive patients who were

declared to have received maximum hospital benefit, even though in individual cases discharge was held up for social or vocational reasons.

All patients who were included in Part I were excluded from Part II of this test.

Part III. To check validity, one examiner was asked to fill out forms on 20 of his own patients and then to dictate a brief summary on the diagnosis, disability, and prognosis of these cases.

A second examiner was asked to do the same for 5 of his own cases, a third for 6 of his own cases, and a fourth for 9 of his own cases.

The first examiner then reviewed the 20 forms of the cases with which he was unacquainted and dictated a brief summary outlining his opinion of the diagnosis, disability, and prognosis as obtained from the forms.

The third and fourth examiners each reviewed 10 of the forms filled out by the first examiner and dictated summaries.

The summaries of the different examiners on each case were then compared, particularly for the salient points:

1. What is the actual disability?
2. What can the patient do?
3. What is the prognosis medically and from a rehabilitation point of view?

Result

The test on 124 patients in different stages of rehabilitation has shown that, at least where a team is available, the forms can be filled out in about one-half hour, using the results of the team evaluation.

Certain revisions in the forms will be necessary as well as some additions. For example, the onset of the impairment, handedness, and marital status should be included. Differentiation between benign and malignant tumors should be possible, diplegia should be listed, and more precise definitions of I.Q. levels should be used. These are some of the many needed changes brought to light in the pilot test.

The ability to reproduce similar data by different examiners was generally fair, but our impression was that this depends to a large extent on the persons filling

37.	VASCULAR <u>Localisation</u>	Coronary Cerebral Peripheral	<input type="checkbox"/> x Thrombosis <input type="checkbox"/> y Embolism <input type="checkbox"/> 0 Rupture	1 Gangrene 2 Arteriosclerosis 3 Hypertension	4 Endarteritis (Buerger's, etc.) 5 Thrombophlebitis 6	7 Other (aneurism, disseminated arterial disease, vis. l upul, polyarteritis, etc.)	<input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9
38.	PULMONARY	Tuberculosis Pneumonia (all types) Pleurisy	<input type="checkbox"/> x Chronic Bronchitis <input type="checkbox"/> y Bronchiectasis <input type="checkbox"/> 0 Emphysema	1 Fibrosis 2 Abscess 3 Mycotic Diseases	4 Embolism 5 Tumor 6 Other	<input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9	
39.	GASTROINTESTINAL <u>Localisation</u>	Esophagus, Stomach, Duodenum Small Intestine and Peritoneum Large Intestine and Rectum Liver, Gall Bladder, Pancreas	<input type="checkbox"/> x Tumor <input type="checkbox"/> y Tuberculosis <input type="checkbox"/> 0 Infection 1 Non-specific inflammation	2 Obstruction 3 Ulcer with or without complications 4 Cirrhosis with or without complications	5 Calculus	<input type="checkbox"/> 9	
40.	ENDOCRINE	Pituitary Anterior Pituitary Posterior Thyroid	<input type="checkbox"/> x Parathyroid <input type="checkbox"/> y Adrenal Cortex <input type="checkbox"/> 0 Testes or Ovaries	1 Hyperfunction 2 Hypofunction	3 Infection (including T.B.) 4 Non-specific inflammation 5 Congenital and degenerative 6 Tumor	<input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9	
41.	Allergic Hay fever Bronchial Asthma Other	<input type="checkbox"/> x Diabetic mellitus <input type="checkbox"/> y Endocrine Obesity <input type="checkbox"/> 0	1 2 3	Nutritional A. <input type="checkbox"/> 3 Syrus B. <input type="checkbox"/> 4 Malnutrition C. <input type="checkbox"/> 5	<input type="checkbox"/> 6 <input type="checkbox"/> 7	<input type="checkbox"/> 8 <input type="checkbox"/> 9	
42.	BLOOD DISEASES Hyperchromic (inc. Pernicious) Deficiency inc. post-hemorrhagic Aplastic	Asmia <input type="checkbox"/> x Sickle-cell <input type="checkbox"/> y Splenic (Bant's) <input type="checkbox"/> 0 Hemolytic	1 2 3	Polycythemia Leukemia (myeloid and lymphatic, acute) Leukemia (myeloid and lymphatic, chronic) Hemophilia	Hodgkin's Disease Purpura	<input type="checkbox"/> 6 <input type="checkbox"/> 9 <input type="checkbox"/> 6 <input type="checkbox"/> 7	
43.	POISONING, DISEASES DUE TO PHYSICAL AGENTS, MISCELLANEOUS Alcoholism Drug addiction Heavy metal poisoning	<input type="checkbox"/> x Carbon monoxide poisoning <input type="checkbox"/> y Other poisoning <input type="checkbox"/> 0 Heat exhaustion Heat stroke	1 2 3 4	Burns Trauma (dislocation without fracture, lacerations, etc.)	5 Mental, Psychoneurotic, and Personality disorders 6 Tumors of Reticuloendothelial System	Tumors not covered elsewhere	<input type="checkbox"/> 9 <input type="checkbox"/> 7 <input type="checkbox"/> 6
44.	SKIN Bacterial Fungal Metazoan (scabies, lice)	Infection <input type="checkbox"/> x Possibly infectious (Pam phigus Dermatitis) <input type="checkbox"/> y <input type="checkbox"/> 0 Herpetiformis	1 2 3	Acne (Vulgaris or Rosacea) Allergy Psoriasis Scleroderma	2 Lupus (circumscribed or disseminated) Erythematosis 3 Decubitus Ulcers 4 Other	Tumor or precancerous diseases Decubitus Ulcers Other	<input type="checkbox"/> 3 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9

Data outlined in this form is summarized in Table 1.

out the forms. The muscle and range of motion tests are usually quite similar. The medical area, which we thought would be troublesome, turned out to be less difficult than expected. Results obtained from different examiners were fairly similar, but in essence this is more a test of the examiner than of the forms.

The validity check gave extremely gratifying results. Agreement between different examiners (those acquainted and those unacquainted with the patient, and who relied only on the forms for information) was very good. There were some omissions, but the main points mentioned in the test procedure were generally well covered and agreed upon. Table 2 gives five cases as an example.

Finally, an example of how this system can be used to obtain statistics is given in the following outline and derived from the patient data obtained in the pilot test. Groups of patients can be combined by common characteristics for statistical evaluation and for determination of the effect of secondary factors on their disability status and rehabilitation potential.

Statistics:

A. Total Number of Patients: 124

B. Etiologies and Pain:

Moderate pain	26
Severe pain	6
Infection	14
Nonspecific inflammation	7
Congenital	2
Degenerative	14
Traumatic	40
Vascular	53
Metabolic	12
Allergic	2
Tumor	5

(Many patients had more than one impairment)

C. Degree of Independence:

Bedridden	3
Wheelchair with assistance	19
Wheelchair independent	45
Ambulatory	57

D. Able to Travel:

.....	71
-------	----

E. Motivation:

Good	109
Poor	15

F. Living Arrangements:

Home or room	116
Institution	8

Table 2

Patient	Age	Race	Sex	Diagnosis	Ambulatory or Wheelchair	Braces or Prosthesis	Prognosis	Employ-ability	Examiner
E. T.	24	N	M	Traumatic paraplegia	Wheelchair	---	Wheelchair independent, technical training	yes	I
	24	N	M	Traumatic paraplegia	Wheelchair	---	Wheelchair independent, semi-skilled work	yes	IV
B. F.	75	W	M	Cerebral thrombosis with left hemiplegia	Ambulatory	Short leg brace, cane	Independent	no	I
	75	W	M	Cerebral thrombosis with left hemiplegia	Ambulatory	Leg brace, cane	Independent	no	IV
D. W. ...	73	W	M	Left above-knee amputee, diabetic gangrene	Ambulatory	Omitted mention of prosthesis	Independent	yes	I
	73	W	M	Left above-knee amputee, diabetic gangrene	Ambulatory	Light prosthesis	Independent	yes	II
A. L.	69	W	F	Right hip fracture, bilateral partial deafness, hypertension	Wheelchair, partial Ambulatory	---	Independent	no	I
	69	W	F	Right hip fracture, partial deafness	Wheelchair	---	Independent	no	III
M. M. ...	45	W	F	Poliomyelitis, paraplegic	Wheelchair	Body corset, leg braces	Self-care	no	I
	45	W	F	Poliomyelitis, paraplegic	Wheelchair	Leg braces, corset	Self-care	no	II

G. Financial Resources:

Adequate	77
Inadequate	47

H. Rehabilitation Potential:

Good	79
Poor	30
Undetermined	15

I. Vocational:

Employable	31
Not employable	64
Employable with reservations	29

J. Sex and Race:

White male	55
White female	44
Negro male	13
Negro female	10
Chinese male	2

K. Age Ranges:

10-19	4
20-29	15
30-39	17
40-49	17
50-59	34
60-69	22
70-79	13
80 plus	2

As another example of what can be done with this method, a further breakdown was done. Some of the characteristics of the hemiplegic group were obtained by simple sorting with the I.B.M. Sorter.

Hemiplegics:

1. Total Count: 43 or 34.6 percent of the total sample of 124 patients.

2. Etiology:

Thrombosis	28
Embolism	5
Hemorrhage	6
Other (includes trauma and undetermined etiology)	4

3. Degree of Independence:

Bedridden	1
Wheelchair with assistance	7
Wheelchair independent	16
Ambulatory	19

4. Able to Travel:

.....	23
-------	----

5. Vocational:

Employable	2
Not employable	35
Employable with reservations	6

6. Rehabilitation Potential:

Good	22
Poor	13
Undetermined	8

7. Motivation:

Good	33
Poor	10

8. Sex and Race:

White male	17
White female	18
Negro Male	2
Negro Female	5
Chinese Male	1

9. Age Ranges:

20-29	2
30-39	1
40-49	4
50-59	16
60-69	14
70-79	6

It is not within the scope of this paper to discuss the significance of these statistics. However, they illustrate the ease with which such details may be obtained using this method.

Summary

The development, outline, and use of new tentative forms for classifying the physical, social, emotional, and vocational capacities of the handicapped are discussed. The results of a pilot test on 124 patients, using these forms, to check their validity, practicability, the need for revisions, and value as a rapid, easy source of statistics, were reviewed. It was shown that these forms provide a method of evaluating disability from a functional point of view.

When the forms are revised, they will again be tested on a large group of patients at several institutions. The last phase of this project will involve testing these forms in use by organizations and groups interested in the functional evaluation of disability.

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Use of Lightweight Synthetic Materials to Fabricate Corrective Shoes

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● A new concept in the design of orthopedic appliances is discussed. New plastics and other light materials should be substituted for the heavy ones now used in the manufacture of these appliances.

In September 1958, the author was asked to design a new corrective shoe for an eighteen-month-old female patient consulting an orthopedic surgeon for correction of a slight torsion of the tibia. The attending physician discussed the use of wedges, or lifts, to insure the proper placing of the foot in the act of walking. The problem of the weight which the lifts would add to the shoe versus the benefit gained by the lifts was also discussed. The conclusion was that the lifts could be beneficial if they did not add to the weight of the shoe. In fact, the shoe should be as light as possible. With this discussion in mind, a shoe with a Thomas heel was taken apart and examined. Many places were found in the design of the shoe where the component parts were much heavier than necessary. For example, the space between the inner-sole and the outer-sole was filled with granulated cork held together with heavy glue. Several changes are described which will permit the shoe to be considerably lighter.

The usual shoe is made almost entirely of leather. The particular shoe under comment weighed 147.4 grams. The shoe was modified by substituting a polychlorotrifluoroethylene polymer, commercially known as fluorothene, for all wedges and the heels. This material, although it is expensive, is ideal for this use in that it is moldable, chemically in-

ert, strong, and may be worked by the shoemaker with the same tools used for working leather. When tested, this material wore better than that originally supplied. A mixture of epoxy resin and aluminum powder was used to replace the metatarsal support, which had been made of steel. The space between the inner-sole and the outer-sole was filled with polystyrene foam. These changes reduced the weight of the shoe to 128.9 grams—a 12.5% decrease. Many other changes, such as using a lighter fabric for the body of the shoe, could be made by a manufacturer. Care must be exercised, however, to retain all of the support characteristics of the shoe. Even the 12.5% decrease in weight is significant if one considers that the shoe exerts a force, due to its weight, at the end of the leg which is a long lever.

In the last six months, the patient has worn the shoes and the foot has shown improvement, although there is no evidence that the improvement was accomplished by the use of the light shoe. It has been stated by a number of physicians, that benefit from the use of lifts for the condition described is questionable. From the biophysical standpoint, there is much to be said in support of the hypothesis that lighter orthopedic appliances may be of benefit where heavier ones have failed.

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Role of Intensive Physical and Occupational Therapy in the Treatment of Cerebral Palsy: Testing and Results

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and
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● Sixty cerebral-palsied children have been subjected to an intensive program of physical and occupational therapy. Progress made by these children has been studied by testing based on a developmental scale of motor and social performance. This developmental scale has been in use for seven years. This test may be improved but appears to be useful in measuring progress objectively, and informative in helping to solve the problem of which patients can be selected most profitably for admission to cerebral palsy installation.

The role of physical and occupational therapy in the treatment of cerebral palsy has been debatable. Some think that any improvement associated with a program of treatment is merely the result of growth, maturation, and response to a favorable social climate. Others prescribe specific programs of physical and occupational therapy for nearly every patient, attribute any improvement to that program, and any failure to neglect of it.

During the first few years of the cerebral palsy program at the Crippled Children's Hospital School in Memphis, Tenn., only the most severely involved children were admitted, and the treatment, though individualized, was highly formal. It soon became apparent that though some patients improved, not all responded favorably, and since this hospital is a treatment center, not a custodial institution, the staff was confronted with the problem of whom to admit. This is not a purely local problem. Centers for treatment of cerebral palsy are being established throughout the world, and there is a chronic and severe shortage of trained therapists whose skills should be reserved for those most likely to benefit from them.

A second major problem with which the staff was faced was how to measure the improvement of the patients. During the early years of our program (1947-1951), voluminous narrative reports were prepared at intervals on each

child by the physical and occupational therapists, in accord with the fashion of the day. These reports were replete with statements about what was "beginning" to happen, or what the child was "ready" to do, and with all the details of modalities of treatment, but the specific area and degree of improvement within a given time were difficult to define. The staff felt that an objective test was needed which would give precise facts and figures lending themselves to statistical analysis, and which would distinguish, if possible, the improvement resulting from growth and maturation and that resulting from specialized treatment.

A wealth of material has been published on the etiology and classification of cerebral palsy, upon the intelligence and emotional adjustment of cerebral palsied children, and upon methods of treating them, but little has been written about measuring their progress and practically nothing about evaluating the results of treatment.

The studies most useful to us have been those of Zuck, Johnson, and Wingate¹⁻³ of the University of Rochester, on a motor age test devised and used at the Edith Hartwell Clinic. Drawing upon Gesell's studies of the development of children,⁴⁻⁶ they designed a test of motor age, using artificial situations and mechanical devices. Each item in this test is assigned a value, and the total score is the sum of the values of the successfully completed items. Indices of handicap are obtained by dividing the chronological age into the motor age of

From the Campbell Clinic and the Crippled Children's Hospital School.
Read at the Thirtieth Annual Session of the American Academy for Cerebral Palsy, Providence, R. I., September 27, 1958.

Crippled Children's Hospital School

Memphis, Tenn.

CEREBRAL PALSY ACTIVITY RECORD

NAME

ADMISSION DATE:

BIRTH DATE:

DISCHARGE DATE:

DIAGNOSIS:

INSTRUCTIONS: Block in square* to show accomplishment. Highest zone with score of more than 50% indicates maturity level.		DATES OF TESTING						
APPARATUS: (braces, special equipment, etc.)								
COMPLICATIONS:								
MATURITY LEVEL: Chronological Motor Social Mental (I.Q.)								
4 Weeks Zone	MOTOR Brief eye following Asymmetric in supine Lifts head momentarily in prone Rolls partly to side Hands fisted SOCIAL Drops toy immediately Heeds sound Small throaty sounds							
16 Weeks Zone	MOTOR Competent eye following Symmetric posture, supine Head erect, slight bobbing Sits propped short periods Arms activate Hands open SOCIAL Incipient approach to toy Regards rattle in hand Spontaneous social smile Vocalizes socially (laughs aloud, etc.)							
28 Weeks Zone	MOTOR Rolls to prone from supine Sits, leaning forward on hands Bounces actively in supported sitting Grasps cube, rakes at pellet SOCIAL Reaches and grasps toy Bangs toy Transfers toy Squeals and crows Expectant in feeding situation							
40 Weeks Zone	MOTOR Pivots in prone position Sits alone Creeps Pulls to feet at rail Crude prehensory grasp and release SOCIAL Combines two toys Chews toys Feeds self cracker Plays simple nursery games Controls drooling Says "Dada-Mama" and one other word Heeds his name							
12 Months Zone	MOTOR Pivots in sitting position Cruises at crib rail Walks with help Good prehensory grasp and release SOCIAL Tries to tower two cubes Puts toy in and out of container Finger feeds Responds "give it to me" Cooperates in dressing Says two or more words							

* For ease in reading this record, the blocking squares (which appear in the original form) are omitted.

Fig. 1A

Crippled Children's Hospital School

Memphis, Tenn.

CEREBRAL PALSY ACTIVITY RECORD

		DATES OF TESTING						
15 Months Zone	MOTOR Stands alone Walks alone, toddles Creeps up steps SOCIAL Casts toys in play Towers two cubes Holds crayon in fist Rubs or bangs crayon on paper Pats picture book Says four-six words Points, vocalizes wants							
18 Months Zone	MOTOR Chews food Walks well alone Runs stiffly Sits self in small chair SOCIAL Towers three-four cubes Imitates crayon stroke Uses spoon, moderate spilling Turns several pages of book Names pictures Jargon Toilet regulated, day							
2 Year Zone	MOTOR Runs without falling Squats in play Up, down stairs alone SOCIAL Towers six-seven cubes Imitates circular scribble Plays with dolls, cars, etc. Handles cup well Manages doors Puts on simple garment Understands simple directions Joins two-three words Asks for toilet, day							
3 Year Zone	MOTOR Handedness determined Stands one foot momentarily Throws ball without losing balance Rides tricycle SOCIAL Imitates house of cubes Holds crayon in fingers Copies cross and circle Feeds self well Turns pages singly Can remove own clothing Puts on socks and shoes Gets self drink of water Sentences Gives name and sex Answers simple questions							
4 Year Zone	MOTOR Throws ball overhand Carries cup of liquid Skips on one foot SOCIAL Builds well with blocks Draws simple forms Identifies several letters Uses scissors Dresses with some assistance Washes and dries face and hands Laces shoes Buttons front buttons Goes on simple errands Plays cooperatively Uses conjunctions and prepositions							
5 Year Zone	MOTOR Handedness established Alternates feet descending stairs Skips on alternate feet Attempts to skate SOCIAL Colors within lines Copies simple forms Cuts, pastes, moulds with clay Dresses without assistance Speaks without infantile articulation Innumerable "why" questions							

Fig. 1B

the upper and of the lower extremities, thus obtaining an upper motor quotient and a lower motor quotient. Progress in terms of months is correlated with variables — diagnosis, intelligence, and type and duration of therapy. The conclusions they arrived at in 1952 on the basis of this test will be discussed later.

In 1951, after consultation with Gesell and Ilg, and with Zuck, Johnson, and Wingate, we devised a scale of the development of motor and social behavior by which to test the level and progress of cerebral palsied patients. It has been applied to 60 consecutive patients admitted to the Crippled Children's Hospital School for nonsurgical treatment. The present study describes this test, analyzes the results, and presents typical cases.

The Test

The test we devised is reproduced as figure 1. It is based primarily on the developmental schedules outlined by Gesell in *Developmental Diagnosis*;⁵ the maturation levels in the various areas of behavior gave a realistic and objective norm against which to test the behavior of our patients. We also drew freely on Gesell and Ilg's *Infant and Child in the Culture of Today*⁶ and *The Child from Five to Ten*.⁴

The test yields two levels or "ages": a motor age and a social age. The motor age represents the basic motor skills of the upper and lower extremities, for example, the ability to walk, and is roughly the province of physical therapy. The social age indicates the ability to operate in society and perform the necessary acts, and is the province of occupational therapy. These skills are tested by a series of activities in each age zone. Testing equipment includes such materials as an exercise mat, doll carriage, practice stairs, blocks, feeding utensils, and crayons.

The test is administered upon the child's admission to the hospital and every three months during his stay; after discharge it is given at intervals varying from three months to a year or more. To minimize frustration, the therapist considers the chronological age

and physical handicap of the child and begins the test at the zone below the one he believes to be the level of performance. He continues the test until the child is unable to accomplish any of the test activities in a given zone. No credit is given for a particular activity until the therapist is convinced that the child has really mastered it. For example, the fact that the child begins to take a few steps does not fulfill the requirement in the 15-month zone, "Walks alone, toddles." At each testing interval, the highest zone of accomplishment is reviewed, activities in the next advanced zones are introduced, and failure or success is recorded. The highest zones yielding scores of more than 50 per cent are considered the levels of motor and social maturity that the child has reached. A graph of the successive zones of achievement in both spheres then gives a clear composite picture of the child's performance and progress.

In seven years of experience with the test, and in reviewing our work, we have been aware that our method of testing the status and progress of cerebral palsied patients has disadvantages as well as advantages, and present them here for consideration.

Advantages. The chief advantage of the test is its objectivity. It reflects what a given patient is able to do at the moment of testing, not what he is about to do in the opinion of the therapist.

Its results can be reduced to a swiftly readable form unencumbered by the minutiae of treatment.

It tests activities which a normal child spontaneously develops in daily life. Thus the patient does not need to be taught any special or artificial technics such as fitting pegs of various sizes into holes, or maintaining a metallic contact in an electrical circuit, and the equipment needed is simple and inexpensive. The test is neither difficult nor time consuming to administer.

It has some diagnostic value. By strict definition, a cerebral-palsied child is one who is physically crippled as a result of damage to the brain. His greatest handicap, then, is in the motor sphere of activity; a lesser handicap

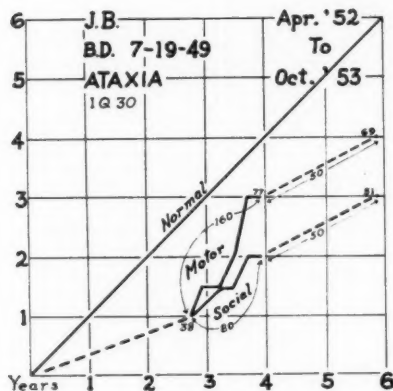


Fig. 2

may be, and usually is, encountered in other spheres. In mentally disturbed patients, and in those with psychomotor epilepsy, the social performance is at a lower level than the motor (fig. 2). On the other hand, in patients with a primary mental deficiency, the social and motor maturity quotients are at approximately the same level as the intelligence quotient.

The test tends to establish in a general way the level of the treatment program. The immediate aim of treatment should be to assist the child to advance from his current level of achievement to the next level, in a progressive, orderly way. For example, if a child performs at the 12-month level in our treatment program, he is treated at the 12- to 18-month level. Needless to say, we had had very poor results when we attempted to teach children to walk independently before they had developed head control, sitting balance, or standing balance, or to write before they had attained prehensile grasp.

Finally, the test serves as a record of progress under treatment. If the child significantly improves, and at a rate in excess of his preadmission level, the treatment program is continued until its aims are accomplished. But if, on the other hand, the child does not so improve, the cause of his failure is diligently sought, and appropriate measures are undertaken. For instance, in some cases motor development improves satisfactorily up to the 18-month zone

(crutch walking), but at this level a specific hip disability, such as marked abductor weakness, adductor spasticity or thrust, or pelvic obliquity impedes independent walking. Such a disability should be corrected. This philosophy has been used in the past as one of the indications for hip abductor transfers, obturator neurectomy, adductor tenotomy, and hip flexion release, and will be used even more enthusiastically in the future.

Disadvantages. In discussing the disadvantages of the test, we do not wish to indicate that it is unreliable or undesirable. Rather, we suggest that when the defects are remedied, it should prove even more valuable than before.

The first defect is that there are insufficient test activities at some levels. Increasing the number of activities being tested at those levels should reinforce the test, and render the results more valid. In our opinion, the optimum number of items at each level in each area is approximately six. The test is not oriented sufficiently toward diagnosis of neurological age. Patterns of reflex activity which are present in the infant and which are normally inhibited and suppressed with growth and development, should in all probability be added, for example, the tonic reflexes, the Babinski reflex, and the startle reflex.

Finally, the test is too short, since it stops at age five, and it is weak in the motor zones above the three-year level. This weakness has provoked considerable thought in the staff. Still, in regard specifically to motor development, the normal three-year-old is fairly independent, and the normal five-year-old has acquired practically all of the basic patterns of motor activity. His future development amounts essentially to achieving new combinations of these basic patterns.

Selection of Patients

The 60 children who were the subjects of this testing program were admitted to the Crippled Children's Hospital School from various sources. Some were cared for through the

Crippled Children's Service Program of the State of Tennessee Department of Health, some through the Crippled Children's Service Program of the Mississippi State Department of Education, and some were private patients of either the senior author or his late associate, Dr. Robert A. Knight. Children who in the opinion of the staff could probably be materially improved were admitted for inpatient treatment. Children mildly affected who in the opinion of the staff could be adequately treated as outpatients, and children too severely affected to warrant optimism, were not admitted. When there was reasonable doubt about the prognosis, the child was admitted on a trial basis for treatment and observation. All those admitted and hospitalized for more than one month are included in this report. Thus, the cases under consideration here are a selected group, and are not a representative cross section of the cerebral-palsied population.

Results

Of the 60 children treated, 20 either did not improve at all (Group I-A), or improved so little that their social or motor status was not significantly altered (Group I-B). Forty children (two-thirds) were significantly improved (Group II). Table 1 summarizes our findings.

Group I-A. In the group unimproved by treatment there were 12 children (20 per cent). Figure 3 pictures a typical case. The average hospital stay was seven months, the median three, and the range between three and 15 months. (The one patient who remained in the hospital for 15 months, a severely athetoid child, was subjected to various forms of treatment aimed at "breaking up" a tonic neck reflex. The therapists and their repertoires were then exhausted, and the treatment was unsuccessful.) The motor quotient in this group averaged 23 on admission, and the social quotient averaged 36. Maturation during treatment was distinctly slower than before admission. Six of these patients have been followed for an average of 17 months since discharge. Two pa-

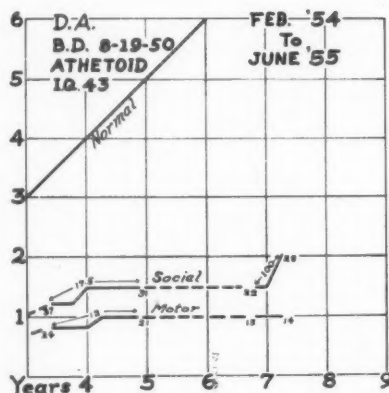


Fig. 3

tients were prematurely discharged: one was removed by his parents; for the other, the prognosis was incorrect, probably because the child did not adjust to the hospital in the three-month period. Since their discharge both of these patients have shown an acceleration in the rate of their social and motor development. The remaining four patients have continued to develop more slowly than they had prior to admission, and all four remain severely handicapped.

A careful attempt has been made to determine objectively the reasons for the failure of treatment in each case in this group. In most cases several obstacles were apparent, but only the one most important in the opinion of the staff was selected for this summary. Severity of involvement was the chief obstacle in four children, mental deficiency in three children, emotional immaturity in two children, and progressive disease of the central nervous system in one child.

Group I-B. Eight children exhibited an improvement in motor and social development which was apparent to both the staff and the families concerned, but the level of performance remained so low that the improvement could not be considered of practical value to either the patient or his attendants. Figure 4 depicts a typical case. On admission the motor quotient averaged 7.8, the social quotient 13.8. (It should be emphasized that no significant improvement was ob-

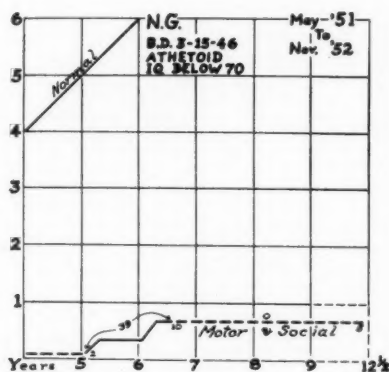


Fig. 4

tained in any patient with a motor or social quotient of less than 15 on admission, in the entire series.) The average and the median hospital stay was 16 months. These children improved between three and five times as rapidly as before treatment, but on discharge their motor and social quotients were all still below 15, and most were below 10. Five of these children have been fol-

lowed for an average of 56 months since discharge, and their rate of development continues to be distressingly slow.

Group II. In 40 cases (two-thirds of the series), improvement was not only measurable objectively, but was of distinct practical value to the patient and his attendants. Figure 5 pictures one of the best results in this group, and figure 6 a typical result. The average hospital stay was 16 months, the median 14, and the range from three to 36 months. Prior to admission the motor quotients averaged 28.6, and the social quotients averaged 39.4. During the period of intensive treatment, motor and social skills were acquired between two and three times as rapidly as before treatment, and all in this group increased their quotients by at least 10 per cent. In most of these patients (29), both social and motor quotients were simultaneously increased, although not always to exactly the same degree. In three patients, the improvement was largely motor; no cause for the discrepancy is apparent. Such a case is depicted in

Table 1: Summary of Results of Tests to Measure Level of Progress of Cerebral-Palsied Children.

Group	No. Patients	Hospital Stay (Months)			Motor Quotient			Social Quotient			Followup	
		Average	Median	Range	Before	During	After	Before	During	After	No.	Months
I-A: Not improved	12	7.0	3.0	3-15	23.0	2.5	2.0	36.3	9.4	51.0	6	17.3
I-B: Not significantly improved	8	16.2	16.0	3-37	7.8	38.2	1.0	13.8	31.0	2.6	5	56.4
II: Improved	40	15.1	14.0	3-36	28.6	77.2	14.5	39.4	89.2	34.2	29	39.0
Average		14.0		3-30								38.0
Total	60										40	

Group	Spasticity	Athetosis	Ataxia	Tremor	Rigidity	Mixed	Age (Mos. and Yrs.)			Convulsions			EEG			IQ		
							Average	Median	Range	Habitual	Isolated	None	Normal	Abnormal	None	Under 70	70-89	90-109
I-A: Not improved	6	3	0	1	2	0	4 ³	3 ³	1 ⁴ -9 ⁹	4	0	8	3	7	2	7	5	0
I-B: Not significantly improved	1	5	0	0	1	1	5 ⁹	5 ⁶	2 ⁴ -9 ³	3	1	4	1	5	2	7	1	0
II: Improved	18	15	3	0	3	1	3 ¹⁰	3 ⁴	2 ¹ -6 ⁸	2	11	24	12	20	8	14	16	8
Average							3 ⁹											
Total	25	23	3	1	6	2			1 ⁴ -9 ⁹	9	12	36	16	32	12	28	22	8

all the patients in the study. It is interesting that almost one-half of our 60 patients had intelligence quotients under 70, and even more interesting, that of these, one-half made significant improvement. This fact tends to confirm an opinion we have long held, namely, that if there is a great discrepancy between the social or motor performance and the level of the intelligence quotient, the prognosis for treatment is favorable, provided the patient is mature enough to be motivated to active participation in the program.

So far as we know, the only authors who have previously reported results of treatment are Zuck and Johnson,³ and it is of interest to compare their conclusions with ours. Summarizing the progress of 36 cerebral-palsied children measured by their motor age test at the Edith Hartwell Clinic, their first conclusion was that spastics respond to treatment better than athetoids. This observation was not substantiated in our series. They observed that children with intelligence quotients above 70 show greater improvement, and we agree with this statement. They decided that the degree of motor handicap is a determining factor in progress; this is also evident in our series. They also thought that the degree of motor handicap parallels the degree of mental deficiency; we think that while this is frequently true, it quite often is not true also. They found that kinetic or group therapy gives better results than passive or static therapy. We feel that the treatment must be highly individualized, as informal and unregimented as possible, and aimed at the level of the child's development. They thought that many children would do as well without treatment. We are in complete agreement with their conclusion that a better selection of patients is necessary. It is our hope that the information presented here will contribute to that end.

Summary

Sixty cerebral-palsied children selected for admission to the Crippled Children's Hospital School in Memphis, Tenn., have been subjected to an inten-

sive program of physical and occupational therapy. Their progress has been studied by testing based on a developmental scale of motor and social performance which has been in use for seven years. The test devised may be improved in some respects. It appears to be useful and informative in helping to solve the problem of which patients can be selected most profitably for admission to our limited facilities for the treatment of cerebral palsy, as well as how to measure their progress objectively. In some instances, too, it suggests avenues of treatment less conservative than those to which this study was limited.

In 12 of 20 patients, no improvement was noted. Most of these 12 children

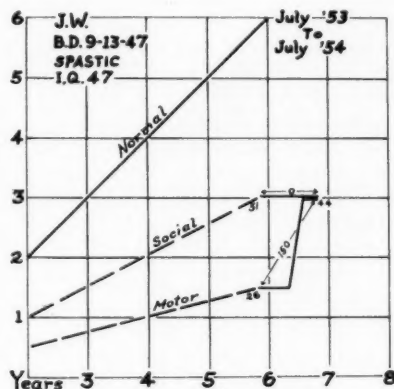


Fig. 7

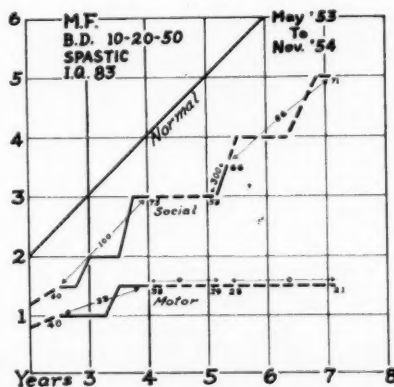


Fig. 8

had been admitted on a trial basis, and when they failed to respond to treatment, they were dismissed. In the remaining eight children, measurable improvement occurred, but the extent and degree of their handicaps was so great that independence from either a motor or a social standpoint could not, apparently, be developed with the conservative treatment presently available.

Two-thirds of the children (40) experienced significant improvement. Those who showed improvement were between 2 and 6½ years of age; the average age was about 3½ years. All children with an intelligence quotient of 90 or above were improved. Of the 60 children, 28 or nearly one-half, had intelligence quotients below 70. Of these 28 children, exactly one-half were also significantly improved. Patients with a past history of isolated convulsive disturbances were not handicapped by it during treatment, but of the nine patients who suffered from habitual convulsive disturbances during treatment, only two were significantly improved. In no child with an initial motor or social quotient of 15 or less was significant improvement noted. Those who did improve had an initial motor quotient of approximately 25, and an initial social quotient of approximately 40. Those who improved gained new motor and

social skills between 2½ and 3 times as rapidly as prior to treatment. Forty of the children were followed after discharge, for an average period of 38 months. In general, those who failed to improve under treatment have shown little improvement since their discharge; those who improved under treatment have generally continued to develop at the same rate as existed prior to their admission.

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Important Announcement —

The next examinations, written and oral, of the American Board of Physical Medicine and Rehabilitation will be held in New York City, June 17 and 18, 1960. The final date for filing application is February 15, 1960. Write to the Secretary, Dr. Earl C. Elkins, 200 First Street S. W., Rochester, Minnesota, for application.

"Pulse of a Nation"
portrait of washington, d. c. i



Air View of Washington, D. C.

Washington is almost as personal to every American as his own home town. Its famous buildings and monuments, avenues and streets are familiar sights throughout our country. Long recognized as one of the most beautiful and cosmopolitan cities in the world and the mecca of people across the country, Washington the city, is one of the leading tourist attractions in the United States.

The site of the Nation's Capital was chosen by George Washington and accepted by Congress in 1790, thereby establishing the Federal District of Columbia. The city of Washington is in, and coextensive with, the District of Columbia.

At the time of the founding of the Capital, the Georgetown area was already a good-sized municipality. This section has narrow, well-shaded streets, and many of the fine homes have been restored.

The cornerstone of the Capitol building was laid in 1793, and by 1800 the north section was completed, at which time Congress moved from Philadelphia to the new Capital. There were few houses, and the streets, planned on such a magnificent scale, were dirt roads with deep wagon ruts, which every rain converted into impassable bogs.

The President's House was first occupied by John Adams in 1799. In 1814, the President's House, the partially finished Capitol and other buildings were burned. Reconstruction work was under way as soon as the war was over and the ruined buildings were soon restored or rebuilt. The name "White House" dates from this era. Built solidly of stone, its blackened walls still stood after the fire, and were painted white when the building was restored. Work on the Capitol continued until 1891.

During the Civil War, Washington was the goal of the Confederate Armies and was repeatedly threatened. On July 11, 1864, General Early and about 19,000 soldiers of the Confederate Army moved toward Fort Stevens. The garrison under General Horatio G. Wright saved the city.

Washington is said to have more miles of tree-shaded streets than any other city in the world. The wide avenues are lined with old trees, the branches frequently meeting in a continuous arch high above the street. Thomas Jefferson planted the first row of poplars along each side of Pennsylvania Avenue in 1803-1804. The city streets, which run north to south and east to west, are intersected by avenues laid out diagonally. Small parks fill the many spacious circles and triangles are formed as the two intersect.

During the summer months free concerts are given by bands of the U.S. Armed Forces at Watergate, a barge in the Potomac River near Arlington Memorial Bridge. There are also concerts on the East Front Steps of the Capitol. Concerts are held at the Commerce Department auditorium and the Departmental Auditorium on Constitution Avenue.

Washington's climate has the seasonal and daily variations which are characteristic of the eastern seaboard. Its winter is shorter and milder than in cities located to the north and west. According to records of the U.S. Weather Bureau, the average maximum temperature is 85 degrees and the average minimum temperature is 67 degrees for the month of August.

The embassies and legations of many countries comprise some of the most attractive and noteworthy buildings in Washington. "Embassy Row," as Massachusetts Avenue, N.W., sometimes is called, is the site of the imposing British Embassy, the largest in the city; the Venezuelan Embassy; the Japanese Embassy and many others. A good many also are on the side streets between Massachusetts and Connecticut Avenues, in the vicinity of Dupont Circle. The Russian Embassy is at L Street and 16th Street, N.W.

Educational institutions include George Washington University; Catholic University of America; Georgetown University (Jesuit); Trinity College and Dunbarton College of Holy Cross (Catholic schools for women); American University (Methodist); Howard University as well as several independent law colleges, art schools and private schools. Gallaudet College is part of Columbia Institute for the Deaf. Washington Missionary College (Seventh Day Adventist) is in nearby Takoma Park, Md.

Walter Reed Army Medical Center, including the Army Medical School and Walter Reed Army Hospital, and the Veterans' Administration Facility are in Washington. The Naval Medical Center, including the Naval Hospital, Dental School, laboratories and related facilities, occupies a 247-acre reservation in nearby Bethesda, Md. The seven National Institutes of Health, covering 300 acres, are also in Bethesda.

First of a series of articles about Washington, D.C. — meeting site of the 3rd International Congress of Physical Medicine. The 38th annual session of the American Congress of Physical Medicine and Rehabilitation will be held in conjunction with the international conference. This material is compiled and prepared for publication by Dorothea C. Augustin. ARCHIVES subscribers are urged to collect these articles as published since they will serve as an excellent sight-seeing guide to our nation's capital. Future articles will contain geographic outlines in which will be detailed pertinent information covering places of interest in Washington, D.C.

Places of Interest

VICINITY OF THE CAPITOL

UNITED STATES CAPITOL, the Nation's most familiar landmark, is on Capitol Hill in a beautiful 131-acre park at the meeting point of the four sections of the city, designated Northwest, Northeast, Southwest and Southeast. The dividing lines, radiating from the four sides of the Capitol, are North Capitol, South Capitol, East Capitol Streets, and the Mall.

The Capitol contains 435 rooms. The two wings, constructed of marble, contain the Senate and House Chambers. The central part of the building includes the Rotunda, Statuary Hall and the old Supreme Court Chamber. A heroic bronze statue of Freedom, 19½-feet high, surmounts the stately dome.

The building may be visited from 9 a.m. to 4:30 p.m. daily. It is advisable to have a guide or a good, detailed guidebook to the points of interest and the numerous works of art. Guided tours through the building, lasting about 40 minutes, are available. Cost of the tour is twenty-five cents for adults. Children under 10 years of age are admitted without charge.

Congress convenes at noon and the floor of the Senate and House must be cleared by 11:45 a.m. Visitors may obtain an admittance card from their Representative to the House galleries and from their Senator to the Senate galleries. Both chambers are open from 9 a.m. to 4:30 p.m., or if either house is in session after 4:30 p.m., until that house adjourns.

SENATE OFFICE BUILDING AND HOUSE OFFICE BUILDING, are on opposite sides of the Plaza which lies in front of the east entrance of the Capitol. Open Monday through Saturday, 8 a.m. to 6 p.m., after 6 p.m., visitors must register. Senators travel from their offices to the Capitol via subway which is also available for use by visitors.

ROBERT A. TAFT MEMORIAL, a few hundred yards north of the U. S. Capitol and one block west of the old Senate Office Building, was dedicated in January, 1959. A carillon tower, the memorial is the first of any kind approved for erection on the Capitol grounds.

SUPREME COURT BUILDING, facing the Capitol, between Maryland Avenue and East Capitol Street is a magnificent white marble building, where the country's highest judicial body holds its sessions. The main part of the building is open Monday through Friday, 9 a.m. to 4:30 p.m., Saturday to noon; the courtroom is open when the court is in session, Monday through Thursday noon to 4:30 p.m. It is closed on holidays.

LIBRARY OF CONGRESS, facing the Capitol and across East Capitol Street from the Supreme Court Building, is of modified, richly ornamented Italian Renaissance architecture. The low copper dome and the Court of Neptune Fountain on the First Street side are notable exterior features. The Entrance Pavilion

and Grand Stairway are noted for their dignity and great precision of detail. The Rotunda, used as the main reading room, is ornamented by statuary around its galleries and under the dome.

The library contains more than 11 million books and pamphlets, over 15 million pieces of manuscript and extensive files of maps, prints, photographs, broadsides, music, newspapers and reels of microfilm. Of importance among the many exhibits are the papers of several Presidents, including Thomas Jefferson's rough draft of the Declaration of Independence and Abraham Lincoln's first and second drafts of his Gettysburg Address. Also interesting are the exhibits of rare books and fine prints. Among several unusual editions of the Bible is the Gutenberg Bible, one of the earliest books printed from moveable metal type. Exhibit halls are open Monday through Saturday, 9 a.m. to 10 p.m.; Sunday and most holidays 11:30 a.m. to 10 p.m. Conducted tours Monday through Friday at 9:15 a.m.; 10 a.m.; 11 a.m.; 1 p.m.; 2 p.m.; 3 p.m.; and 4 p.m.; begin at the Office of the Captain of the Guard on the ground floor of the Main Building.

FOLGER SHAKESPEARE LIBRARY, 2nd and East Capitol Streets, just east of the Library of Congress, contains a small theater in the style of the public playhouse of Shakespeare's time. A model of the

famous Globe Theatre and other relics of the Elizabethan era are on display in a large exhibition gallery. The remainder of the building is a reference library of source material for background study of Anglo-American civilization. The theater and gallery are open, without charge, 11 a.m. to 4:30 p.m. on weekdays. It is closed on Sunday and holidays.

U. S. BOTANIC GARDEN is on the west side of the Capitol, at First Street and Maryland Avenue. The \$1,000,000 conservatory contains many rare plants, both native and foreign. The Orchid House at 2nd Street and Independence Avenue is of interest. It is open daily without charge, 9 a.m. to 4 p.m., and Saturday until noon.

VOICE OF AMERICA, U. S. Information Agency, 2nd floor, Health Education and Welfare Bldg., 330 Independence Avenue, S.W. This radio service, designed to provide factual news and commentary reports to people all over the world, broadcasts in 41 languages over a network of 85 transmitters. Tours of the broadcasting studios, and a special exhibit depicting the government's overseas information program are conducted, without charge, Monday through Friday at 11 a.m. and 3 p.m.

we meet . . .

in washington, d. c. . . .

in 1960 . . .

abstracts

Medical Care in U.S.S.R. George U. Wood.
Bull. Los Angeles County M. Soc. June 4,
1959.

The author describes a trip to Europe in 1958 which had as its primary purpose the study of the Soviet system of medical education, medical care, hospitals and public health programs. Mr. Wood was permitted to use a tape recorder during interviews with Soviet officials and was also permitted to take pictures of hospitals and clinics.

Russians wishing to study medicine must pass a university entrance examination. The average age of admission to medical school is 17 years. On qualifying for and entering the university, the student receives from the government a monthly stipend of 300 rubles (\$75.00) during his first year. Later on in his course this is increased to 500 rubles (\$125.00). There are approximately 25,000 students enrolled in the University of Moscow with 60 nationalities represented. Moscow has two medical institutes in each of which 4000 students are enrolled. Medical training requires six years of study. It is of interest to note that during this interval students are required to devote 250 hours to political studies while 216 hours are given to the study of biology, 397 hours to anatomy, 250 hours to embryology and 213 hours to general surgery. Doctors wishing to specialize in a particular field of medicine and/or surgery must first pass a competitive examination. Specialization training is carried out by one of two methods—the Practical Method and the Academic Method. Under the former method the doctor associates himself with a specialist who acts as his preceptor for a period of three years and supervises all his work. Under the Academic plan he is associated directly with one of the teaching hospitals connected with the Institute of Medicine. According to the Director of the Institute of Public Health and the History of Medicine, there are 360,000 physicians practicing in the Soviet Union. Of this number, 76 per cent are women.

There is no national medical association to weld physicians into a corporate entity. Physicians who are members of the communist party automatically attain priority status in any medical setup. This status means that a substantial portion of party physicians are in a position to give direct orders to the non-party physicians. Rules

and regulations governing the administrative and medical staffs are made by the Ministry of Health. In each city and town, a committee is appointed by the Medical Council of the local health department to review the quality of work performed in hospitals. There is thus produced a direct line of control over the health of the entire population and over medical services delivered to it.

How does the doctor in the U.S.S.R. fare financially? How does his pay rate compare with the over-all wage scale? The Director of the Institute of Medicine—a position and rank comparable to that of the Dean of a Medical School in the United States—receives 7500 rubles (\$1875.00) a month. In addition he is provided with a furnished house, servants and an automobile. A professor with a degree of First Candidate of Medical Science receives 2000 rubles (\$500.00) a month. If he has a Second Degree, his compensation is 3000 rubles (\$750.00) per month and so on with the salary being increased up to 5000 rubles (\$1000.00) monthly depending upon the number of degrees he has earned. A Board Specialist with a full time appointment in a hospital can earn from 1000-2000 rubles (\$250.00 to \$500.00) monthly.

Free medical and hospital care for the soviet populace is provided by the state and is financed from the state budget. The quality of medical care available to the individual varies with his political status that is, every soviet citizen, man woman and child is assigned to a certain medical category; this, in turn, being determined in the case of the adult population solely by his position in the political hierarchy. Two basic medical systems are in operation—the "common or general" network and the "closed or restricted" network. There exists a third medical system. It is ultra-restricted in its services and is least documented as to details. The best hospital accommodations and the best services are reserved for the top state and party officials.

The author describes the pharmacopeia as well as an active program designed to protect children from poliomyelitis, myocardial infarction treatment and treatment of pneumonia. Extensive details of childbirth are cited. The author also states his belief that the quality of medical and surgical practice and patient care in Russia is high. Express-

sions of good will from the Soviets to the Americans and from the Americans to the Soviets are detailed in the article.

Anti-Inflammatory Effects of Counter-Irritants. C. Laden; R. Q. Blackwell, and L. S. Fosdick. *Am. J. Physiol.* 195:712 (Dec.) 1958.

Experimental inflammation was induced in the pleural cavity of rats by injecting 5 cc. of an irritant solution. Simultaneously counterirritation was obtained by injection of an irritant into the knee joint of the rat. The pleural fluid volume at specified time intervals was used to determine the degree of inflammation. The animals receiving counter-irritation maintained significantly lower pleural fluid volumes than the controls. This effect could not be explained by loss of fluid into the knee nor by stimulation of the pituitary-adrenal axis. It was still present in hypophysectomized and adrenalectomized rats. The smaller pleural fluid volumes could not be explained by increased lymphatic drainage. It is suggested that the counter-irritant in damaging tissue releases substances into the blood which reduce inflammation remotely by controlling capillary permeability.

Acute Effects of X-radiation on Reflex Arcs of the Spinal Cord. K. Carrington; F. D. Fowler, and E. A. Bering, Jr. *Neurology* 9:251 (April) 1959.

Fifty-one hundred roentgens were delivered to the spinal cord of 10 cats at the levels L1 to L7. In four cats transections at C1 were previously performed. Reflex activity in the transected cats was studied by stimulating the posterior root and recording at the anterior root at the L7 level. Stimulation was performed hourly for 11 hours after irradiation. In the non-transected cats mild clinical weakness appeared in the first 24-36 hours after irradiation followed by recovery on the second day. Weakness reappeared on the sixth or seventh day progressing to complete paraplegia in 48 hours. Analysis of the stimulus response curves showed that the response time increased at the sixth hour and continued progressively to lengthen during the remainder of the 11 hour period. Concurrently the response amplitudes decreased, particularly in the polysynaptic region. The polysynaptic response was almost absent at 11 hours and the monosynaptic amplitudes, although also reduced, always remained a single spike. The decreases in conduction rates are believed to be a general reaction for all fibers. The polysynaptic response changes suggest aberration in interneuronal activity as well as a decrease in conduction rates. Pentobarbital sufficiently

alters recorded reflex activity so that it should not be used in the study of spinal reflex activity.

Neurologic Aspects of Porphyrria. R. W. Naef; R. G. Berry, and N. S. Schlezinger. *Neurology* 9:313 (May) 1959.

Two case reports of patients with acute intermittent porphyria who came to autopsy after death from respiratory paralysis are presented. In one of these, neurological symptoms were the presenting complaints. Post mortem examination revealed the pathology to be confined to the nervous system. The predominant pathologic process was one of varying degrees of damage to the myelin sheaths in peripheral nerves unassociated with vascular disease. In the spinal cords the only consistent pathological change was limited to retrograde changes in the anterior horns and damage to the dorsal nucleus of the vagus. The literature of the clinical and pathological findings in porphyria is reviewed as are the hypotheses proposed to explain the neurological changes. The current most promising explanation points to a defect in purine metabolism. Purine and porphyrin have a common precursor and a metabolic block at the point where the precursor is normally changed to purine may result in a reduction in purine formation. The purines are found in many coenzymes and nucleotides.

Treatment of Myasthenia Gravis with Prolonged-Action Mestinon. K. R. Magee, and M. R. Westerberg. *Neurology* 9:348 (May) 1959.

The need for longer acting medications for myasthenia, particularly for nighttime use in the severely involved patient, is recognized. This study was designed to evaluate the new prolonged-action Mestinon (Mestinon Bromide Timespan), a sustained release capsule. Twenty patients with well established myasthenia were selected for the study because of their intelligence and understanding of their disease. Their subjective responses comprised the results. Although there was wide variation in the drug's effect, making it impossible to predict its value for any one patient, several general points emerged. Its value at bedtime in producing a stronger patient in the morning was the most consistent effect. During the day it was found to be more difficult to regulate than regular Mestinon because of the inability to adjust to rapidly changing requirements. The dose of Mestinon Timespan was not strictly comparable to the patients' requirements when on regular Mestinon. The nocturnal benefit alone, if for no other reason, makes it a valuable addition to the antimyasthenia drug preparations.

Cerebellar Dysfunction Associated with Chronic Alcoholism. J. B. Decker; C. E. Wells, and F. McDowell. *Neurology* 9:361 (May) 1959.

Greenfield in his book states that no differential diagnosis is possible during life between the different forms of cerebellar and spinocerebellar disease. The authors in this clinical study suggest a disease entity that they feel stands apart from the mass of cerebellar disorders. Ten patients are discussed as a group and two case reports are given. All patients were chronic alcoholics and had the classic symptoms of cerebellar disease. The clinical course of the cerebellar dysfunction was divisible into three phases. The main features of the clinical course were a history of five years' addiction before the onset of cerebellar symptoms, the relative absence of other evidence of nutritional deficiency, the paucity of abnormal laboratory data and the improvement with abstinence, diet and vitamin therapy. The acceptance of this clinical entity as solely cerebellar disease is weakened by the presence in some of the patients of disease in other systems even though slight and by the absence of autopsy corroboration.

Intracranial Hemorrhage as a Complication of Anticoagulant Therapy. K. D. Barron, and G. Fergusson. *Neurology* 9:447 (July) 1959.

Five case reports of patients who died from intracranial hemorrhage accompanying the administration of anticoagulants are presented. In two of these, the history disclosed repeated episodes of multiple cerebral embolism; and in one, recent embolization was present. In the remaining two severe hypertension prevailed. The prothrombin time in all was beyond recommended therapeutic levels. An additional case is mentioned in the addendum where fatal hemorrhage occurred in a hypertensive patient whose prothrombin time was within therapeutic levels. The 58 reported cases in the literature, of fatal intracranial hemorrhage associated with administration of anticoagulants, are reviewed. Value of anticoagulants in cerebrovascular disorders is not denied in this article. Caution in its use in patients with hypertension or recent cerebral infarctions, particularly those due to embolism, is the point stressed.

Ten-year Followup Study of Surgically Treated Hypertensive Patients. Geza de Takats, M.D. *Geriatrics* 14:361 (June) 1959.

In this report the author is essentially making a plea for physicians, especially internists, to consider the surgical treatment of essential hypertension. Apparently this means of treatment has fallen out of vogue during

the current popularity of the hypotensive agents. The author presents the follow-up results of 105 patients operated during the period 1934-1946. These patients fell into three categories—those with intermittent hypertension, those with rising diastolic pressure in spite of adequate medical care, and those with rapidly progressive premalignant or malignant hypertension but with renal function not below 15 per cent phenolsulfonphthalein excretion in 15 minutes. The author briefly discusses his severity index classification and just as scantily presents the pre- and late post-operative severity indexes in the surviving 79 hypertensive patients. Generally speaking, 60 per cent of his patients were better 10 to 20 years after surgery. He finally discusses the general criteria for surgical intervention and cautions the reader about being too optimistic about the long-term effects of the hypotensive agents.

Correlation of Handedness and Degree of Joint Contracture in Bilateral Muscle and Joint Disease. Gerald Edelstein. *Am. J. Phys. Med.* 8:45 (April) 1959.

Reduction of muscular activity is a major factor contributing to the development of joint contractures. To understand better the relationship between the degree of activity and the extent of the contracture, the author compared the joint ranges on the dominant with the joint ranges on the non-dominant side in patients with bilateral disabilities. The disabilities included muscular dystrophy, amyotonia congenita, rheumatoid arthritis and spinal cord injuries. There was a statistically significant greater range on the dominant side in shoulder flexion, extension, and abduction; forearm pronation and supination, and in hip flexion. Comparison of the ranges in internal rotation of the shoulder and flexion-extension of the elbow, wrist, knee and ankle were not significantly different.

Whiplash Injury. Emil Seletz. *J.A.M.A.* 168:1750 (Nov. 29) 1958.

Whiplash injuries are a common occurrence in this mechanized age and present a problem to the physician because of the frequent residuals of these injuries with a paucity of physical findings. In this paper, the author hypothesizes the neurophysiological basis for the pain and disability in this syndrome and also discusses the rehabilitation of these patients. Initially the patient's symptomatology may be due to persistent muscle spasm, trauma to the cervical roots and cranial nerves, or vertebral artery compression. Later, the patient may develop symptoms secondary to foraminal encroachment as a result of degenerative changes. There are rarely x-ray findings to

back up the clinical impression and not infrequently the patient is referred to a psychiatrist because of the absence of findings. In the treatment of this condition, the author recommends initially that the patient have local heat, massage, and cervical traction for a period of two to three weeks. He then should have exercises to correct faulty posture and may need a neck collar for support.

Survey of 230 Medical Patients in the Baltimore City Chronic Disease Hospital. Douglas Carroll, and Elmer McKay. J. Chron. Dis. 9:671 (June) 1959.

In this paper the authors discuss the physical profile to be used on patients in a chronic disease hospital which more simply and concisely indicates the medical, nursing, and rehabilitation needs of the patients in these institutions. Their physical profile includes eight categories of function. These were: 1. cardiac which includes a description of the functional capacity and therapeutic classification; 2. the general physical condition; 3. the upper extremities; 4. the lower extremities; 5. the sensory components including vision, hearing, and speech; 6. the excretory functions; 7. the psychiatric or mental status, and finally, 8. the patient's rehabilitation potential. Under each of these items in the profile the patient was given a grade of 0, 1, 2, or 3, indicating no abnormalities on up to severe abnormalities requiring constant medical and nursing supervision. This report contains numerous tables and graphs indicating the age range of the patient, the diagnoses and finally graphs indicating the overall view of a number of patients in each category of the physical profile. Of the 14 diagnoses listed, the majority of them had neurological or cerebrovascular diagnoses. The majority of the patients were 61-83 years of age. The information collected using this system of categorizing showed that 60 per cent of the patients in this institution were nursing home candidates needing constant medical and nursing supervision and that 21 per cent of the patients showed possibilities of discharge with rehabilitation or intensive medical care.

Prolonged Intravenous Administration of Iron to Normal and Anemic Rabbits. Hwe-Ya Chang; Stanley L. Robbins, and G. Kenneth Mallory. Lab. Invest. 8:1 (Jan.-Feb.) 1959.

Iron is received by the body through the dietary intake, blood transfusions, various oral iron medications, and more recently by intravenous administration. It is now appreciated that it is possible to overload a patient with iron, leading to excessive deposition in tissues and organs. The authors refer to Heiliner's

work, which indicates that patients with idiopathic hemochromatosis have a high absorption of iron and they suggest that the two conditions, hemochromatosis and the exogenous overloading of iron may differ more in quantity than in quality. In this study 103 albino rabbits were divided into two groups, normal and anemic (made so by repeated bleeding). Part of the rabbits in each of these groups were then injected with varying doses of intravenous iron for different periods of time. The other part of the groups was used as a control. The authors then sacrificed the animals and studied the gross and microscopic appearance of their tissues. They also stained the tissues in order to demonstrate hemosiderin and free iron. The organs and tissues of the control group were uniformly normal with the exception of several cases of periportal fibrosis. The normal iron-injected and anemic iron-injected rabbits showed the greatest amount of iron in the spleen, liver and other reticuloendothelium tissues and to a lesser extent in the pancreas, gastrointestinal tract and skin. Twenty of the 42 normal iron-injected rabbits showed varying degrees of periportal fibrosis and eight of 37 of the anemic iron-injected rabbits showed periportal fibrosis which was less severe than in the former.

In their discussion the authors comment on the pattern seen in these animals where the reticuloendothelial system was loaded first with the iron-deposited pigment and later, when this system was saturated, the parenchymal tissues began showing the iron. They also noted that the progressive alterations in the animals' tissues resembled those of idiopathic hemochromatosis except for a failure to identify hemofusion (as described by Mallory). They conclude that prolonged, intense administration of iron may result in tissue changes that progress from hemosiderosis of the liver to pigment cirrhosis and anatomical patterns resembling idiopathic hemochromatosis.

The Carpal-Tunnel Syndrome. Radford C. Tanzer. J. Bone & Joint Surg. 41A:626 (June) 1959.

This is a clinical study of 22 cases of carpal-tunnel syndrome involving 24 hands. The author describes the appearance of the median nerve, anatomical variations and pressure changes in the carpal-tunnel during wrist flexion and extension in the patients as compared to autopsy material. Tanzer also indicates certain historical and physical findings which he feels are of etiologic significance. Operative exploration showed abnormalities in all but two hands. These included nine pseudoneuromata, definite nerve constriction within the proximal third of the canal in eight hands, and significant adhesion formation around the nerve in six, besides a

number of other more specific congenital abnormalities or definitely pathological conditions. The pressure changes did not appear to be significant nor was there any increased thickness of the transverse carpal ligaments, and the size of the median nerve varied considerably with edema in some and pseudo-neuromatous thickening in others. When there was constriction it usually occurred in the proximal third of the tunnel. From the evidence accumulated the author concludes that there is some predisposition to this syndrome. This may be familial, as was the case in four patients, or it may be an occupational hazard especially in those people who work for extended periods of time with their wrists flexed. Anatomical variations may also make the median nerve particularly vulnerable.

The Ankle Joint in Relation to Arthrodesis of the Foot in Poliomyelitis. Robert H. C. Robins. *J. Bone & Joint Surg.* 41B:337 (May) 1959.

This paper is a 10-24 year follow-up study of 60 patients who were operated by either triple or pantalar fusion for ankle instability after poliomyelitis. Their ages at operation ranged between 8 and 53 years. All patients showed evidence of a sound subtalar fusion and in only three patients was there sufficient deformity to cause persistent lateral instability. The loss of anterior-posterior movement was minimal and in no patients were there any complaints of this loss. Only two patients showed radiographic or clinical evidence of osteoarthritis and neither had symptoms. The author also discussed the flail foot and reviewed Steindler's and von Baeyer's work showing how the equinus position of the foot helps in extending the knee. In the author's series there were eight patients with flail feet who were treated by triple arthrodesis. The results were satisfactory in three patients where there was adequate control of the knee but in the other five, with associated paralysis of the quadriceps, all but one showed a flexion contracture of the knee requiring an appliance for its control. The remaining eight patients, six of whom had paralyzed quadriceps, underwent pantalar arthrodesis and all had satisfactory results.

Clinical Application of a Transistorized Survey Electromyograph. Y. T. Oester; Theodore Fields, and George Anast. *Am. J. Phys. Med.* 38:5 (Feb.) 1959.

Oester, et al describes a small, battery-operated electromyograph for use in the examining room and at the bedside, which displays the muscle potentials solely by means of a loudspeaker. This instrument was constructed in the physics laboratory of the Radioisotope Service, VA Hospital, Hines, Ill. It has a battery life of 200 continuous hours,

has a frequency response between 25 and 2000 cycles per second and uses a 25 gauge coaxial needle. Fifteen normals and 15 patients with various muscular dysfunctions (primarily peripheral nerve injuries) were studied, comparing the oscilloscope tracings and the loudspeaker responses with a standard electromyography instrument. The authors felt that their apparatus was adequate for doing survey electromyography in determining the presence of motor unit potentials under voluntary control and for recognizing signs of denervation and regeneration, i. e. fibrillation and polyphasic potentials.

Studies On Pain. Louis Berlin; Helen Goodell, and Harold G. Wolff. *A.M.A. Arch. Neurol. & Psychiat.* 80:533 (Nov.) 1958.

This study attempts to contribute further to the understanding of pain utilizing qualitative methods on normals; on patients with peripheral nerve lesions, and on patients with central nervous system disease. There were 29 subjects in this study; 19 of whom were hemiparetic, two with brain stem disease, four with peripheral nerve lesions with a sensory deficit and four normals. The Goodell dolorimeter was used to quantify the pain both by recording the amount of current necessary to produce pain and also the time it took a low intensity stimulation to elicit pain. The authors made numerous observations but perhaps the main one is that patients with central nervous system disease causing a hemiparesis had increased pain threshold in areas showing extinction as compared to homologous areas with intact sensation. In conclusion the authors commented that consistent and easily demonstrated extinction during the neurological examination was evidence of perceptual dysfunction and that apparently this impaired central integration of sensation was due to central inhibition induced by a dominant stimulus.

Internal Menstrual Protection: Use of a Safe and Sanitary Menstrual Cup. Rebecca Liswood. *Obst. & Gynec.* 13:539 (May) 1959.

Clinical trials demonstrated that the Tassette menstrual cup provides satisfactory internal protection without discomfort, irritation, or any other ill effects. It proved to have many advantages over the ordinary menstrual pad and the vaginal tampon. With use of this menstrual cup most women can continue their customary activities and even enjoy dancing, swimming and athletics during menstruation. The Tassette is an anatomically designed cup made of soft, pliable rubber. It acts as a catch basin for the menstrual blood and seals off the upper vagina like a diaphragm. The double rim, measuring 1 3/4 inches

in diameter, is thickened and rounded so as to engage the vaginal musculature and hold its position securely. The receptacle is two inches deep and the capacity one fluid ounce. There are six tiny perforations below the rim of the cup for the purpose of releasing the semi-vacuum when removing it. The soft pliable rubber of the menstrual cup adjusts itself comfortably to the changing positions and functions of the body and is much preferable to the solid tampon. A small amount of surgical lubricating jelly should be used to facilitate insertion. When in position inside the vagina, the Tassette leaves a free space between it and the cervix. Therefore it does not obstruct the free flow of blood from the uterus.

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The Editorial Board of the *ARCHIVES OF PHYSICAL MEDICINE AND REHABILITATION* has established a special subscription rate of \$5.00 per year to be granted to bonafide residents in physical medicine and other specialties in the United States, its territorial possessions, Mexico, Canada, United Kingdom and Europe. The following rules apply:

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book reviews

The reviews here published have been prepared by competent authorities and do not necessarily represent the opinions of the American Congress of Physical Medicine and Rehabilitation and/or the American Academy of Physical Medicine and Rehabilitation.

THE REHABILITATION CENTER PLANNING: An Architectural Guide. By *F. Cuthbert Salmon, AIA, and Christine F. Salmon, AIA.* Cloth. Price, \$12.50. Pp. 164. The Pennsylvania State University Press, University Park, Pa., April, 1959.

This publication has fulfilled its intent to act as a guide to rehabilitation center planning through the contribution of architectural assistance. It is a result of a project conducted by the Pennsylvania State University and its co-sponsors, The Conference on Rehabilitation Centers and the American Institute of Architects.

The material presented is an analysis of observations, discussions, studies by various panels and architectural associations. This guide contains solutions to the problem of rehabilitation and deals with such sections as the rehabilitation program, its place in the community, medical treatment training, social adjustment, and the selected reference. Naturally, the many plans and illustrations will give the reader a file for his own use. (*Edward C. Augustin, AIA*)

ANNUAL REVIEW OF PHYSIOLOGY. Vol. 21. Edited by *Victor E. Hall.* Cloth. Price, \$7.00. Pp. 636. Annual Reviews, Inc., Grant Ave., Palo Alto, Calif., 1959.

The importance of up-to-date review articles in the physiological and biochemical fields grows each year, with the mushrooming literature and the pertinent material on each subject appearing from many scientific disciplines. The formula for a satisfactory review is far from established, however. The active worker in a field requires a highly documented article with a minimum of author's interpretations; the scientific reader seeking to be informed in a field in which he is not actively engaged, needs interpretive guidance if he is not to flounder. There are articles in this volume which fit well one or the other of these categories. The difficult one is that which tries to be both encyclopedic and interpretive at the same time, and fails at both.

The editors' policy of reviewing Soviet literature on one subject in each volume is continued with notable success. The opening chapter dealing with the heat production of

nerve and muscle up to 1914 is somewhat of an innovation since the interest is mainly historical, and it is to be a chapter in a forthcoming monograph. As it stands, it is an engrossing account of the early history of an elusive scientific search; the pitfalls, the near misses, the search for improved technics, and makes an exciting narrative.

Probably the most useful aspect of review articles of the several types mentioned is for the reader who wishes to begin an exhaustive review of a subject and also for the reader who was well informed several years ago and wishes to bring his knowledge up to date. The reviewer's opinion of the several articles must always be colored by his relative interest in the different subjects and by his degree of background knowledge, and so no comments on specific subject chapters are offered. (*R.C.D., M.D.*)

CURRENT THERAPY, 1959. Edited by *Howard F. Conn, M.D.* Cloth. Price, \$12.00. Pp. 781. W. B. Saunders Company, West Washington Sq., Philadelphia 5, 1959.

The reviewer does not habitually refer to volumes of this kind and therefore has read a number of topics in the present volume with considerable interest. There is an inevitable degree of variability in the quality of discussion of the various topics and occasional inevitable minor inconsistencies. Some authors (e.g. in discussion of tumors of brain) felt that extreme brevity was required. Others insisted on at least mention of differential diagnostic considerations. There are 305 contributors in this 781 page volume, a fact which should make it possible to have truly up-to-date information each year. But, alas in the discussion of gout the time lag has forced the leaving out of discussion of the best uricosuric agent (zoxasolamine).

The editor, of course, runs the risk of including contributors who ride a hobby, and should be criticized for singling out a hobbyist in the case of the discussion on multiple sclerosis. With no part of the discussion in that section could the reviewer agree, except for a few sentences such as the author's confession that he speaks frankly and honestly to his patients about their disease. Physical measures in the various diseases are naturally

mentioned as adjuvant to other forms of treatment and never discussed as rehabilitation as a whole.

The reviewer's summation of this volume is on the whole favorable. The book should certainly be in every emergency room and on every ward, where discussions like that on the care of the patient in diabetic coma might be literally lifesaving. (*Sedgwick Mead, M.D.*)

ELECTROCARDIOGRAPHY. By *Michael Bernreiter, M.D.* Cloth. Price, \$5.00. Pp. 134, with illustrations. J. B. Lippincott Company, E. Washington Sq., Philadelphia 5, 1959.

With so many books already written on this subject it is this reviewer's opinion that there is no need for another, especially since it makes no contribution to the extension of knowledge in the field. The fundamental principals of electricity and physiology as a basis for electrocardiology are over simplified. It would be difficult to interpret electrocardiograms on the background as set forth in this book. The choice of illustrations is acceptable but the interpretations, although generally accurate, are based on long experience rather than from deduction of the electrophysiological facts as presented. The book appears to be the formalized presentation of the professor's teaching material.

A CONCISE TEXTBOOK OF ANATOMY AND PHYSIOLOGY APPLIED FOR ORTHOPAEDIC NURSES. By *Joyce W. Rowe, S.R.N.* and *Victor H. Wheble, M.A.* Cloth. Price, \$8.00. Pp. 684, with illustrations. The Williams & Wilkins Company, Mount Royal & Guilford Aves., Baltimore 2, 1959.

Though all systems are described from the anatomical and physiological standpoint, emphasis is placed upon structures which are of particular interest to the orthopedic nurse. Definitions are simple. Explanations are clear-cut, making them easily understood by individuals whose background in science is relatively limited. A third part is given over to regional anatomy and physiology—surface and regional anatomy of the head and neck, the upper extremities and trunk and lower limbs. The final chapter discusses posture and body mechanics.

This book was designed for nurses particularly interested in orthopedic problems. The language and descriptions are simple; it is easily understood. It is a textbook which should be examined by the Directors of Nursing Schools. (*Frances Baker, M.D.*)

METALS AND ENGINEERING IN BONE AND JOINT SURGERY. By *Charles O. Bechtol, M.D.*; *Albert B. Ferguson, Jr., M.D.*, and *Patrick G. Laing, M.B.* Cloth. Price, \$8.00. Pp. 186, with illustrations. The Williams & Wilkins Company, Mt. Royal & Guilford Aves., Baltimore 2, 1959.

This excellent volume tells of the use of metals in orthopedic surgery and the behavior of these metals when imbedded in tissues. The first two chapters (by Ferguson) deal with the history of the use of metals in the body and with their reactions to their situation in use. The next three chapters (by Laing) discuss the metals available for surgical employment, the phenomenon of metallic transfer, and the use and care of metals for surgical purposes. The last four chapters (by Bechtol) deal with the structure of bone, replacement of living tissue, fracture healing, and internal fixation with plates and screws. There is appended an engineering and orthopedic glossary.

The book is well written and nicely produced. It contains an important fund of information basic to the use of metals in the body. This information is of value not only to orthopedic surgeons but also to general surgeons and physiatrists, and to all those people in the medical setting who have anything to do with the handling of metallic implants prior to their insertion into the patient. The book is highly recommended. (*G. Keith Stillwell, M.D.*)

A TEXTBOOK OF MEDICINE. Edited by *Russell L. Cecil, M.D.*, and *Robert F. Loeb, M.D.* Tenth Edition. Cloth. Price, \$16.50. Pp. 1665, with 171 illustrations. W. B. Saunders Company, West Washington Sq., Philadelphia, 1959.

This edition brings the text up to date covering the past four years since the last issue. New material outlined in the preface indicates how successfully this has been done. The list of contributors contains an illustrious group of physicians who made this book possible. The various subjects covered, as indicated by the table of contents, speak for its completeness. The dates of the references also indicate that it can be described as current. Special emphasis has been placed on the index which is so important in this type of a textbook.

The sections of most interest to the readers of the *Archives of Physical Medicine and Rehabilitation* are probably those dealing with the locomotive system and the bones and joints. These subjects are adequately covered but no detailed references made to the use of physical therapy, nor, is there any particular reference to rehabilitation. Not too much emphasis is placed on the diseases occurring in old age. Physiatrists will be disappointed in the lack of reference to the electromyographic

findings in the diseases of the anterior horn cell and muscles. Another possible criticism is a lack of illustrative material, but, one can readily realize that this might add excessively to the size of an already large book. This book should continue to hold its own as an outstanding reference text for medical students as well as for the busy practitioner. (Arthur L. Watkins, M.D.)

THE DEGENERATIVE BACK AND ITS DIFFERENTIAL DIAGNOSIS. By P.R.M.J. Hanraets, M.D. Cloth. Price, \$19.95. Pp. 690, with illustrations. Elsevier Press, Inc., Bank of the Southwest Bldg., Houston 2, 1959.

The explanation for low back pain continues to present many problems with regard to diagnosis. This book is an attempt to collect as much data as possible regarding symptoms and signs, surgical findings at the time of operation, interpretation of these findings, and interpretation of results.

There are many pain-provoking mechanisms. Clear knowledge of the entire anatomy of the low back, considering its bone, joints, ligaments, capsules, muscles, must be clearly understood. The syndrome often thought to point to the existence of herniated nuclei pulposi is not necessarily pathognomonic for this affliction. The personality structure of the individual, with its manifestations, is considered under the term "the degenerative back."

The author thinks that where a definite diagnosis of herniated nuclei pulposi is made that surgical therapy can alleviate the complaint. There are other indications for the need of surgery. Special diagnostic methods are presented and various forms of pathology have been studied to explain symptoms. Where radicular pain exists, the state of irritation affects the two-thirds distal part of the root where this runs in the root-sheath between the dural sac and the ganglion. The irritation may be due to various causes.

Many factors can predispose to limitation of space, including anomalies of the cauda equina and surrounding membranes. Constitutional predisposition to spinal disorders are reviewed — asthenia; anatomy of the spinal column; decalcification of the skeleton; the posterior longitudinal ligament; stenosis of the spinal canal; flat-oval shape with a wide spinal canal. Many other anomalies are discussed. Because of the excellent care taken in discovering basic ideology, the surgical results have proved much more satisfactory.

This is a very remarkable book. One cannot begin to review it. It is full of information and requires most careful study. There is no other subject which so needed this careful analysis. (Frances Baker, M.D.)

THERAPEUTIC ELECTRICITY AND ULTRAVIOLET RADIATION. Edited by Sidney Licht, M.D. Cloth. Price, \$10.00. Pp. 373, with illustrations. Elizabeth Licht, Publisher, 360 Fountain St., New Haven, Conn., 1959.

This is the fourth in the series of physical medicine books written by physicians primarily for physicians. There are nine contributors including Alexandre N. Obrosow, Professor, Institute of Physiotherapy, Moscow, U.S.S.R. This contributor has written a chapter on electrosleeptherapy. This subject has received little publicity and less general acceptance in the United States, except by the psychiatrists. The physiology underlying this method of sleep production is as unknown as the underlying principles of normal sleep. It is a form of narcosis but not "shock therapy" and should not be confused with it.

The chapter on clinical electric stimulation is excellent and should be recommended reading for all physicians who use electrical stimulation for any purpose. It is primarily a physiologic explanation of what electric currents do to muscles and nerves. It could easily have made a valuable contribution to Volume I of the series, *Electrodiagnosis and Electromyography*. The presentation of the physiologic effects of ultraviolet radiation is also an outstanding contribution. An understanding of these two chapters could lead to a more rational use of these two treatment modalities.

The historical chapters written by the editor are both outstanding in presenting a picture of the use of electricity and ultraviolet irradiation down through the ages. The reviewer believes that if more physicians used these modalities abiding by the principles as presented in this book there would be more application with better results. This would probably lead to more fundamental research which in turn would lead to more rational clinical uses.

NUTRITION AND ATHEROSCLEROSIS. By Louis N. Katz, M.D.; Jeremiah Stamler, M.D., and Ruth Pick, M.D. Cloth. Price, \$5.00. Pp. 146, with illustrations. Lea & Febiger, 600 Washington Sq., Philadelphia, 1958.

This monograph is a review of the recent research on atherosclerosis — its dietary and endogenous causes, prevention, and possible treatment. After a brief introduction the authors consider the nutritional factors in atherosclerosis. Atherosclerosis is discussed as a disease, which is preventable, reversible, and up to a point, curable. The decisive role is played by altered cholesterol — lipid — lipoprotein metabolism, and the basic guilt is laid to an unbalanced diet, excessive in total calories, empty calories, total fats, saturated fats, cholesterol, refined carbohydrates, and salt,

and inadequate in certain essential nutrients, including vitamins, minerals, essential amino acids, essential fatty acids, and in bulk. The authors establish a logical step-by-step series of proofs based upon three investigative approaches; namely, epidemiologic, clinico-pathologic, and animal experimental.

Hormonal and other endogenous factors causing atherosclerosis are discussed. Most important potentiating effects are produced by diabetes, hypothyroidism, renal disease, familial hypercholesterolemic xanthomatosis, and hypertension. In human beings as well as in experimental animals these potentiating factors produce lesions only upon a nutritionally produced potential for atherosclerosis.

The final chapter has to do with definitive approaches to prophylaxis and treatment of

atherosclerosis. The prophylaxis consists of attention to diet and physical exercise. The aim is to reduce weight, cholesterolemia, and high blood pressure. Specific recommendations are made as to what to eat and what to avoid. The authors might have included here some mention of Parsons and others whose recent work shows the value of nicotinic acid in the reduction of serum cholesterol levels and beta-lipo-protein cholesterol levels. The book is well written, and thoroughly authenticated by numerous graphs. An intensive bibliography, including 787 references, makes this a valuable addition to the library of all physicians interested in this number one killer. (Harry T. Zankel, M.D.)

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Never — in anything great or small,
large or petty — never give in
except to convictions of honor and good sense."***

— SIR WINSTON CHURCHILL

medical news

Readers are invited to send to this office items of news of general interest, for example, those relating to society activities, new hospitals, education, etc. Programs should be received at least six weeks before date of meeting.

"Homestead Plan"

Expansion of the city's pilot "Homestead Plan" and program to help the chronic disabled and aged was pledged on June 23 by Mayor Robert F. Wagner at dedication ceremonies opening the new \$500,000 Maurice B. Hexter Rehabilitation Wing at Beth Abraham Home For The Chronic Ill, 612 Allerton Ave., the Bronx. Additional disabled persons, who because of their medical and nursing needs cannot return to the community, will be housed and cared for in specially designed and equipped infirmaries adjacent to hospitals.

These new infirmaries, utilizing existing hospital buildings, are adjacent to the general medical wing of the institution so that the residents of the "Homestead" may be immediately transferred should they need medical care from time to time. This separate and independent Homestead relieves the patient of the routine and boredom of hospital life and affords him an opportunity for greater comfort, recreation and rehabilitation. The program provides 1856 beds in five separate institutions located in different parts of the city.

This new wing named after Dr. Maurice B. Hexter, executive vice president of the Federation of Jewish Philanthropies of New York, is a monumental symbol of the record of achievement of that great leader, educator and author, who has contributed so much to the social welfare of this community. The Hexter wing is one of the most modern and scientifically equipped centers for the care of the chronic ill and disabled. It houses the division of physical medicine and rehabilitation including the departments of physical therapy, hydrotherapy, electrotherapy, occupational and speech therapy, recreation and music. The new rehabilitation center is housed on the ground floor of Beth Abraham's recently opened \$3,500,000 Henrietta and Stuart Hirschman Pavilion. The 531-bed non-profit institution is deservedly recognized as the largest and foremost voluntary nursing home for the chronically ill and aged in this country—standing as a symbol of hope and better life. Beth Abraham Home is the largest voluntary nursing home for the chronically ill in the United States. The institution has

won national recognition for its many pioneering activities and programs in this important area of health. It is the only nursing home holding membership in the Greater New York Hospital Association, New York State Hospital Association and the American Hospital Association. This institution is affiliated with and receives its major philanthropic support from the Federation of Jewish Philanthropies.

After Poliomyelitis What Next?

The Georgia Warm Springs Foundation has completed its expansion into broad new health areas in which skills gained in thirty years of rehabilitating poliomyelitis patients are being applied to a wide range of other physical handicaps. Arthritis patients are now receiving treatment at Warm Springs, along with patients disabled by birth defects, amputations of arms or legs, traumatic paralysis and other disabling neuromuscular disorders. New patients include youths and adults disabled by motorcycle and auto accidents, farmers injured in tractor accidents, industrial workers hurt in factory mishaps, older men and women suffering paralysis from strokes, and many others.

With the advent of the Salk vaccine four years ago, plans began to develop for the day when poliomyelitis would no longer require full attention and help could be given to many patients disabled from other causes. As the need for care of the physical handicaps caused by poliomyelitis is met, Warm Springs Foundation is morally bound to utilize its facilities to care for the infinite number of other problems that could reasonably be expected to be solved through the training and experiences in the care of poliomyelitis. While each disease or injury has its own peculiar problems, the basic principles of care at Warm Springs Foundation are applicable to most, if not all, physical handicaps. Warm Springs has accepted these responsibilities, not for the selfish reason of continued existence, but rather to assume its rightful place in the field of medical care and education. The Foundation has sought to create for all physical disability the same philosophy of total care that has been

attempted to develop for poliomyelitis. More than one-fifth of all patients treated in 1958 at Warm Springs were affected by conditions other than poliomyelitis and the percentage figure is growing steadily in 1959. There still are thousands disabled by poliomyelitis who will need further care. There are millions who have not yet received the Salk vaccine and thus are still susceptible to new poliomyelitis attack. It is fully realized at the Warm Springs Foundation that poliomyelitis will continue to be a big part of work of the Foundation. Warm Springs was founded originally by Franklin D. Roosevelt as a poliomyelitis rehabilitation center, and as long as there are poliomyelitic patients who seek treatment here Warm Springs will continue to receive them. The National Foundation, originally the National Foundation for Infantile Paralysis, which developed in 1938 as an outgrowth of the Warm Springs Foundation, has recently expanded its program to include arthritis, birth defects, virus diseases and disorders of the central nervous system as well as poliomyelitis. The two organizations are entirely separate entities, but have worked closely together since their beginnings.

Rehabilitation Centers Lauded

An insurance industry spokesman extolled the progress made in rehabilitating paraplegics and quadriplegics at leading medical centers of the nation recently, pointing out that modern therapy practices now make it possible to restore a majority of these patients to limited activity.

J. E. Linster, vice president in charge of claims for Employers Mutuals of Wausau, Wis., cited eight rehabilitation centers for outstanding contributions in providing services vital to the recovery of shattered lives. This list included the Institute of Physical Medicine and Rehabilitation at New York University's Bellevue Medical Center, New York City; Kessler Institute for Rehabilitation, West Orange, N. J.; Mayo Clinic, Rochester, Minn.; Jewish Hospital of St. Louis, Mo.; California Rehabilitation Center, Vallejo, Calif.; Baylor University Hospital, Dallas, Tex.; The Bay State Medical Rehabilitation Clinic, Boston; and Duke University, Durham, N. C. Of 56 Employers Mutuals workmen's compensation policyholder employees who sustained paraplegic and quadriplegic injuries during the last nine years, 42 were sent to the eight rehabilitation centers which specialize in this type of case. Rehabilitation has been successful in 27 cases with seven of the employees actually returning to full-time employment, and the others "reasonably active" in home and community. These particular centers are near the home communities of the 42 patients and there are other fine clinics and hospitals throughout

the country that are also doing an excellent job in the field of rehabilitation. Since many medical experts believe the paraplegic and the quadriplegic have the same life expectancy today as the average person, it is estimated that savings in medical costs on these 27 successfully rehabilitated cases alone would amount to millions of dollars. The skill and patience of rehabilitation centers' personnel and the insurance firm's team of specialists for recoveries have led to making life more meaningful to the rehabilitated. Attitude of the individual patient also was important in degree and speed of recovery. One case in which a paraplegic who had good reason to doubt he would ever be able to lead an active life again works regularly as a veterinarian's assistant, goes to night school, drives his own car and participates in community activities. His biggest problem is trying to locate a wheelchair strong enough to hold up under the strain of the rugged terrain he travels on his hunting expeditions. Another case cited is that of a 32 year old paraplegic who suffered an injury to his spine in 1954 and was confined to a hospital bed. Two years later he was discharged and since that time has not only managed his own farm, but does a good deal of the physical work involved, such as feeding stock and driving a tractor. These cases are continuing evidence that the rehabilitation centers are doing a truly outstanding job. It is important to use centers which specialize in this type of case because they usually have many paraplegics and quadriplegics in various stages of treatment. An individual with an injury of this severity has good reason to doubt he can do very much. He is greatly encouraged when he sees other patients who have progressed to the point where they can do many things. He also is inclined to want to do just a little more than the other patients, and gains much from this spirit of competition.

You Are Not Alone

A practical addition to the literature for parents on help for the crippled child is "You Are Not Alone", a 32-page booklet which is a guide to sources of care and treatment. The fourth in a series of publications designed to help parents of crippled children, "You Are Not Alone," written by Lawrence J. Linck, outlines the many types of assistance through professional persons, voluntary agencies and federal services which are available today to give help to the physically handicapped. This booklet outlines the tremendous resources of good will, knowledge, experience, skill and capacity which are found in those individuals, organizations, institutions and programs that exist to help. An additional concern of this publication is helping meet the parent's need to understand his responsi-

bility to the crippled child and to use the many skills and talents available to him. Advances in human welfare, science, medicine and education made in recent years dictated the necessity for "You Are Not Alone." In addition to presenting facts, bibliography and a list of voluntary health and welfare agencies who offer help to parents, the author attempted to set out in lay language the part medical specialists, paramedical personnel, including all of the therapies, and others of professional skills play in the rehabilitation of the crippled child. Other booklets in the parents' series are "Why Did This Have to Happen" by Earl Schenck Miers, an inspirational "open letter" by a widely known editor and writer who speaks with insight and personal experience of problems faced by those who are crippled; "Your Child's Play" by Grace Langdon, Ph.D., which describes what toys mean to any child and their value in the rehabilitation of those who are under treatment; and "Toward Understanding Stuttering" by Wendell Johnson, Ph.D., a study that can help parents avoid stuttering in their children and make the wonders of speech a source of strength, joy and wisdom for their child. Copies of these publications, at 25 cents each, can be secured from the Publications Section, National Society for Crippled Children and Adults, 2023 West Ogden Avenue, Chicago 12, Illinois.

Notices of Judgment under the Federal Food, Drug and Cosmetic Act

Niagara Devices

In possession of Ralph E. Dixon, Minneapolis, the following were investigated: 5 Niagara Hand Units, 2 Niagara Thermo-Cyclopads, 1 Deluxe Niagara Thermo-Cyclopads with Niagara Hand Unit, and 1 Deluxe Niagara Thermo-Cyclopads without Hand Unit. The charges were (1) — "the labeling accompanying the devices, when shipped, contained false and misleading representations that the devices provided an adequate and effective treatment for impaired circulation, arthritis, bursitis, rheumatism, lumbago, numbness of the extremities, fibrositis, nervous tension, muscle spasm, muscle and joint mobility, insomnia, and renewing one's life; (2) while held for sale, the labeling of the devices failed to bear adequate directions for use in preventing and overcoming calcium deposits; in overcoming "locked joints" and sinus congestion; in enabling diabetics to stop taking insulin; in overcoming prostate trouble, asthma, hay fever, respiratory conditions, and baldness, which were the conditions for which the devices were intended and for which they were recommended orally by Ralph E. Dixon in promoting the sale of the devices."

Schlessing Ultrasoniseur Devices

The following charges were made on 75 devices shipped by A. Schlessing & Co. Inc., St. Louis to Los Angeles and Santa Monica, Calif.: "the strength of the devices differed from, and their quality fell below, that which they purported and were represented to possess since their ability to produce total sound output (ultrasonic) differed materially from the ability which they were represented to possess and the output meter (dosimeter) did not accurately gauge the energy density output of the devices; the labeling of the devices . . . contained false and misleading representations that the devices would provide an adequate and effective treatment for the cure of "abscesses, arthritis, arthrosis deformans, asthma bronchiale, morbus bechterew, bronchiektasy, claudicato intermittens, furunculosis, sciatica, carbunculus, lumbago, mastitis, myalgia, panaritium, paronychia, paronychia humeroscapularis, phlegmones, prostata hypertrophy, sinusitis macillaris, ulcus cruris, effusions of the joints, abscesses of perspiratory glands, gingivitis, stomatitis, parodontosis, pulpitis, infiltrations, especially granulomas, bursitis, Dupuytren's contracture, endangitis obliterans, fistulae, lymphangitis, paronychia, polyarthritis rheumatica, post-operative pains, morbus raynaud, tendovaginitides, trigeminal neuralgiae, thrombophlebitides, ulcus ventriculi, kidney stones, spinal arthritis, gum boils, kidney colic, gastric ulcer and asthma"; the following statements contained in the labeling of the devices were misleading; in leaflets entitled "Please Read Carefully": "This Machine is Absolutely Safe", "that they may WALK again . . .", "Is the Schlessing Ultrasoniseur Difficult to Operate? Not at all. The technique if (sic) the very simplest. No special skill, no involved instructions and no long experience is necessary to use the Schlessing Ultrasoniseur properly. Is the Schlessing Ultrasoniseur Safe? Yes. With ordinary precautions. Ultrasoniseur treatments are absolutely painless. There are no contraindications. No danger of deep burns, tissue damage or irritation. Equally important, there are no possible harmful effects to the person administering treatment." The labeling of the devices failed to bear adequate directions for use for the purposes for which they were intended."

"Six of the devices were reconditioned from a physical standpoint to the satisfaction of the Department of Health, Education and Welfare; and reconditioning of the other 41 devices was suspended until a final decision was made regarding the legality of claimant's proposed method of distribution of the six reconditioned devices to licensed California chiropractors, in whose possession the devices were seized at the outset of the libel action. The Department refused to release the devices for such distribution; and on May 24, 1953, the claimant filed with the United States District Court for the Southern District of California

a motion to compel administrative approval of the claimant's proposed method of distributing the devices." This motion in court and an appeal were unsuccessful and on 27 November 1956, pursuant to the order of the district court, the U. S. marshal destroyed 47 devices which had been seized.

Head Harness Device

Fifteen devices consisting of chains, a doorway hanger, and a head harness with accompanying pamphlets entitled "Well I'll Be Hanged! Stretch Your Spine for Health" were seized in Salt Lake City, Utah, shipped from Idaho Falls, Idaho, by Clifford Thiede. The charges were "the designation . . . and the labeling of the devices contained false and misleading representations that the devices were an adequate and effective treatment for normalizing the spine muscles, spasm, osteoarthritis, disc degeneration, herniated disc or disc protrusion, neuritis, headaches (migraine), nervous disorders, premature aging, poor circulation, poor elimination of waste material, decreased body functions, chronic strain, thinning of the vertebral discs, back and neck troubles, serious injury and malfunctioning of the organs of the body, and promoting and maintaining health; the devices should be restricted to sale only on prescription since they were devices, which because of any potentiality for harmful effect, or the method of their use, or the collateral measures necessary to their use, were not safe except under the supervision of a practitioner licensed by law to direct the use of such devices, and hence for which "adequate directions for use" could not be prepared; and their labels failed to bear the statement 'Caution—Federal law restricts this device to sale by or on the order of a . . . (the blank to be filled in by the professional designation of a properly licensed member of a professional group.)'." This resulted in re-labeling by Clifford Thiede.

Medical Cost Is Analyzed

A letter in a Chicago newspaper stated that costs of medical care have increased far more rapidly than the cost of housing, food, and other necessities. The writer put the blame for this increase on high fees charged by physicians.

Look at some facts as published by the Bureau of Labor Statistics. Comparisons with 1939 show that the 20-year increase for medical care (106.09 per cent) is below the increase for all items. (108.08 per cent) and for food (149.09 per cent.)

Here are additional figures from the same source which show physicians are not overcharging. In 1933, the man-hours of work needed to pay for a visit to the average doctor's office were 4 hours and 48 minutes. To-

day, it only takes 1 hour and 42 minutes of work to pay for a visit.

In 1933, the man-hours of work needed to pay for the average doctor's call on a patient amounted to 7 hours and 42 minutes, in comparison today with 2 hours and 48 minutes.

Doctors are making more money today, as is everyone else, but probably no more than other people of similar intelligence and educational background. What is more, in general, doctors work harder for it.

Another element of medical care is hospital costs, which have risen a good deal. But compared with rentals on housing or hotel charges, these costs are not out of line.

The nation's drug bill is higher, too. However, the price of drugs that were in existence a decade ago has advanced little.

The big increase is for drugs added in recent years and which have produced wonderful results in saving lives and reducing the incidence of disease.

Protest Filed Against Vitamin Ad

The American Medical Association filed an official protest with the Federal Trade Commission against a recent advertisement of the Vitasafe Corporation, a New York City mail-order vitamin house.

The advertisement, which appeared in newspapers and magazines, featured a premium give-away offering "The Official AMA Book of Health" plus a 30-day supply of "high-potency" capsules.

The AMA told the FTC it believes Vitasafe Corporation attempted to imply in the advertisement that the AMA endorses one of the company's products. It said this is not true.

Cigaret Trial

Medical testimony is expected to play an important part in a Chicago trial centering on alleged harmful effects of smoking cigarettes. Suit for \$25,000 against a cigaret company and a grocery chain was filed by a woman whose husband died of cancer of the lung. Suit is scheduled for late in fall and may be first of its kind to reach trial stage.

Aging Conference

Funds totaling \$202,000 were granted 15 states for financing state conferences on aging and to help pay costs of state participation in the 1961 White House Conference on Aging. Grants, ranging from \$5,000 to \$15,000, are made by Department of Health, Education, and Welfare.

Tranquilizers Shield Brain

Tranquilizers may literally be umbrellas that protect the brain from a shower of stresses and strains.

Structurally, tranquilizers resemble atropine which is known to dry the mouth and stop intestinal movement, or curare, the Indian arrow poison that paralyzes muscles. All have large umbrella-like chemical structures which may shield the nerves from stimulating substances, Dr. T. C. Barnes, formerly of Hahnemann Medical College, Philadelphia, reported to the American Pharmaceutical Association meeting in Cincinnati.

Dr. Barnes bases this explanation of tranquilizers upon the results of an experiment with neurotic mice. He found that one tranquilizing chemical, stelazine, was three times as powerful as thorazine in subduing the neurotic behavior of the mice. Stelazine has an added piperazine ring to the three-ring umbrella structure of thorazine. A good umbrella must have a handle, Dr. Barnes continued. In the phenothiazine tranquilizers, this essential part of the structure is a row of three carbon atoms. The nerve is accustomed to this handle because it is present on several natural neurohumoral agents such as adrenalin and histamine.

The newest umbrella tranquilizer is mellaril or thioridazine which has a four-ring structure like stelazine, but which lacks the essential "handle," the three-carbon chain. This may explain why it is so weak, the researcher speculated.

A mental patient may require a gram of mellaril where five milligrams of stelazine would do the job. In major epilepsy, the umbrella theory works very well, Dr. Barnes pointed out. All drugs used in severe fits have a phenyl or flat benzene ring structure which may have a protecting or screening effect. For example, phenobarbital is the only sleeping pill or barbiturate used in severe epilepsy, and the only phenyl "umbrella" in this large group of drugs, he explained.

Feed a Cold and Starve a Fever

The old saying "feed a cold and starve a fever" is wrong. A fever must be watered and fed, not starved, warn two physicians at the Medical Research Institute of Michael Reese Hospital in Chicago.

Fever leads to the breakdown of body tissues, Drs. Rachmiel Levine and Sidney Cohen report, and the body loses water. At high temperatures the body cells work and break down faster. When a fever reaches 103 degrees Fahrenheit or more, it becomes dangerous. The central nervous system does not function normally and high fever can injure the heart. A child's body temperature will react more sharply with a fever than does an

older person's. Reactions to fever-causing agents are slower and not as drastic in the older person.

There is no general remedy for fever, they say. Fever caused by infection is reduced by eliminating the infectious agent. Other causes of fever include food intake, excessive fatigue, hypersensitivity to drugs, cirrhosis of the liver and pregnancy. Fever, the scientists point out, is not a disease but rather a symptom which should be thoroughly investigated by a medical doctor. Some persons, however, have a normally higher-than-average temperature.

Stimulate Heart Beat Through Jugular Vein

A new method of stimulating the heart through the jugular vein is described in *The Lancet* (August 1). This should be particularly valuable in anesthesia emergencies, during acute heartblock or when circumstances are not favorable for methods such as heart massage that involve opening the chest cavity says Dr. F. F. Weale of Guy's Hospital, London, England.

Five dogs with experimentally induced heart block were studied. An insulated wire electrode was passed down the dog's right jugular vein into the right ventricle. An artificial cardiac "pacemaker" was then connected to the electrode and to a skin electrode. In each case, Dr. Weale reports, there was "satisfactory ventricular response" at voltages roughly a quarter of those needed for another method of stimulation.

Special tests with two of the dogs showed that some blood clots had formed, "plugging" the external jugular vein. However, clots surrounding the electrode lead did not materially obstruct the return blood flow of the superior vena cava, one of the body's main veins. There was also no evidence of burned heart tissue, the British researcher says. In purely medical cases, he explains, anticoagulants may be useful.

The method avoids the "considerable discomfort" found with "external" electrodes, Dr. Weale says.

Northwest Section ACPM&R Meets

The Northwest Section of the American Congress of Physical Medicine and Rehabilitation meets on October 15, 1959, at the VA Hospital, American Lake, Washington. Dr. Louis B. Newman of Chicago and Dr. Donald A. Covalt of New York will appear on the program.

On October 14, a program is planned in Tacoma, Washington, which is sponsored jointly by the Pierce County Medical Society and the American Academy of Physical Medicine and Rehabilitation. It will cover the

broad field of rehabilitation; all interested physicians are invited. Dr. Philip Lee; Dr. A. L. Sahs, and Dr. James B. Brown will also be program participants.

Psychology Internship Program

Program Management: The Psychology Department of the Institute for the Crippled and Disabled conducts the Internship Program for Clinical and Counseling Psychology. The Department is a part of the Institute's Social Adjustment Service which also includes the Departments of Psychiatry, Social Service, Speech Therapy, Group Work and Recreation, as well as a Mental Hygiene Clinic licensed by the State of New York.

Training: Psychology interns at the Institute for the Crippled and Disabled receive training in diagnostic testing, interviewing, and in individual, group, and play psychotherapy. Weekly seminars on diagnostic, therapy and research problems are conducted in collaboration with other training institutions. Training is also given in the conduct of research. Interns participate in research projects which are currently being planned or are under way at the Institute.

Supervision: Senior full-time members of the Psychology Department provide continuous supervision in all phases of the Internship Program. Provision also is made for regularly scheduled psychiatric supervision and consultation.

Professional Relations: Extensive experience in working with the Institute's comprehensive rehabilitation team is provided through participation in large staff case conferences and smaller, informal team meetings.

Approved for clinical and counseling psychologists by the Education and Training Board of the American Psychological Association.

Open to graduate students who have successfully completed at least two years of training toward the Ph.D. degree in clinical or counseling psychology at approved institutions.

Each intern is given full use of the professional facilities of the Institute, including use of the staff library, and such research and clerical assistance as he may require in the performance of internship assignments.

Stipends ranging from \$3,600 to \$4,200 per annum are provided, the amounts varying with the availability of funds. The Internships are supported jointly by the Office of Vocational Rehabilitation and The Institute for the Crippled and Disabled.

For further information, contact Dr. Harold Chenven, Chief Psychologist, Institute for the Crippled and Disabled, 400 First Ave., New York 10, N. Y.

This Year's Best Student

This year's best student at the Joseph Bulova School of Watchmaking, Mr. Theodore Thuesen of New York City, was given the Max Epstein Memorial Award during the school's alumni association ninth annual homecoming. The award certificate and \$100 cash prize were presented by Mrs. Epstein, of Brooklyn, widow of the former school instructor who died in 1955. The school was founded in 1945 and provides tuition-free training for paraplegics and other disabled veterans and civilians. Faculty certificates for outstanding student work were given to Roger Wheeler, of Phelps, N. Y., and Robert Hay, of Des Moines, Iowa.

Wisconsin's New Service

The University of Wisconsin Medical Center's Respiratory and Rehabilitation Center—aimed at restoration of disabled patients to the greatest possible physical, mental, social, and vocational capacity—began serving the state. The center is located in the remodeled 7th floor of University Hospitals where opening of the new facility was observed at brief ceremonies.

A Wisconsin physician may refer to the center a polio patient, the victim of a farm, automobile, or driving accident, or of any severely disabling disease or injury which demands long term reorganization of the patient's life. Staff teamwork will apply a broad range of evaluation or "total patient care" to each case admitted to the center.

Patients paralyzed from an accident or from diseases such as poliomyelitis frequently need braces, splints, or perhaps an "artificial muscle" to make up for the muscle power they have lost. The center has an orthetist, whose job is to design, adapt, and make devices which permit the patient to do things for himself that would otherwise be impossible.

A medical social worker, will care for patients' personal family, or financial problems resulting from long periods of hospitalization.

An outstanding advantage of the new center is its close connection with the hospital and the University. Aid from the department of clinical psychology and the Speech and Hearing Clinic will be available. The advantage of University association also is demonstrated by the center's attractive furnishings which were constructed by University employees. The UW facility is also concerned with basic research.

The third major purpose of the center is teaching. Several staff members are on the medical school faculty and will teach in their respective fields. Students and others in the medical and allied fields will be invited to visit the 7th floor where they will be able to observe the team approach and total patient care philosophy in action. The staff hopes

that aims and methods of treatment that prove valuable at the center will be carried out to other hospitals and facilities by students.

The new facility, one of 15 similar institutions in America, is supported by funds from the State of Wisconsin and organizations such as the Sister Elizabeth Kenny Foundation, the Benjamin Wishner Estate, the Bess Heath Estate, the United Fund of Marathon County, and the Oscar Mayer Foundation of Madison.

Comic Strip MD

Dr. Guy Bennett, an industrious internist with a thriving practice in 15 countries around the world, *never, never* diagnoses matters obstetric or gynecologic in his patients. "Urine" and "bowel" are out of his vocabulary, and he never says "die."

The graying, 44-year-old Dr. Bennett, who recently made it all the way back from a coronary attack to a busy, useful life in his second-floor office in the Georgian Medical Arts Building, conducts this increasingly purified practice in the fishbowl atmosphere of the comic pages of 85 newspapers.

Dr. Michael A. Petti, creator of Dr. Bennett, not long ago was reminded that newspaper editors maintain a separate set of standards for the "funnies" when, with his usual medical authenticity, Dr. Bennett was diagnosing a case of diabetes.

"The urine is turning orange," the character said, holding up a test tube, and Dr. Petti's protest mail swelled, from both editors and readers. Dr. Petti lost the battle by agreeing to keep the nasty word out of Dr. Bennett's mouth in the future, but he won the war. Three faithful readers in Australia, matching the other diabetic symptoms, took urine samples to their physicians and the self-diagnosis was confirmed in each case.

"I started out to educate the public, but I got educated instead," said Dr. Petti, a practicing internist and senior clinical instructor at Western Reserve University School of Medicine. "And one of the basic facts of comic strip life is that education alone won't sell. The strip also has to be entertaining." But that too has its pitfalls.

Plotting entertainment into an educational strip on otosclerosis, Dr. Petti placed a deaf teacher in a classroom and surrounded her with some "blackboard jungle" types. When the pupils framed "the teach" in a bar and grill, howls went up from teachers around the United States.

"There are all sorts of groups I never knew existed," said Dr. Petti. An idea on psittacosis was killed by Arthur J. Lafave, head of the feature syndicate handling Dr. Bennett, before Dr. Petti could set it down on paper and forward it to artist Frank Thorne in Westfield, N. J. Lafave could foresee protests from the bird lovers of the world.

When complaining letters arrive in the middle of a sequence, such as the teacher incident, or when a woman writes that her brother must have been the model for the epileptic who went from one office to another unsuccessfully seeking a job, Dr. Petti writes a soothing answer to the effect that right, taste, and justice will win out in the end. He advises patience.

No amount of patience, however, will soothe indignant foreign editors who expect Dr. Guy Bennett to comport himself so he handles only cases that can simultaneously be happening in Yugoslavia, England, Brazil, Finland, South Africa, Hawaii, the Philippines, Australia, and Canada, among other places. Rabies? Don't have them in England, old boy, nor cancer quacks. Frostbite? Unknown in Brazil. Black widow spider bites? No good for Finland.

When the time came to explore coronary disease, Dr. Bennett had the attack himself. Other acceptable and popular subjects in the strip have been hyperthyroidism, a pancreatic tumor, asthma, subdural hematoma, and poisoning.

Anticoagulants Suggested to Avert Postmastectomy Upper Arm Edema

Edema in the upper arm in women who have undergone breast removal is attributable in many cases to thrombophlebitis in the veins of the axilla and arm, Dr. Magnus I. Smedal, radiologist at the Lahey Clinic, Boston, told the 21st midsummer conference of the Rocky Mountain Radiological Society.

Studies at the Lahey Clinic, Dr. Smedal said, have shown that venograms reveal obstructive thrombi in a significantly large proportion of women with upper arm edema and pain following mastectomy. Also visible, he said, are networks of collateral circulation established in the area in response to the thrombi.

Dr. Smedal said upper arm edema has been considered an unavoidable result of mastectomy in about 40 per cent of cases.

The reason for the edema, he said, has never been made clear. Skin grafts, metastases to axillary nodes, x-ray treatment, and wound infection have been considered causative. But there are studies that have shown virtually as much upper arm edema in patients who do not undergo these procedures or who do not have these conditions.

This led the radiology and vascular sections of the Lahey Clinic to investigate the possibility of thrombophlebitis by using venograms, he said. Thrombophlebitis in the region of the axilla was found in 23 of 27 patients.

Several of these, Dr. Smedal said, responded satisfactorily to anticoagulant and dissolvent therapy. In those who did not respond or responded only slightly, further venograms showed sustained block.

Among possible causes of the phlebitis in these women, Dr. Smedal suggested a previous history of phlebitis, presence of cancer in the axillary nodes, and the positioning of the patient's arm during surgery, leading to retarded blood flow through the veins.

The clinical pathology of phlebitis in these patients appears virtually identical to that seen in patients with phlebitis of the lower extremities, he said. He suggested the possibility of preventing upper arm edema and pain through the use of postsurgical anticoagulants.

In another presentation at the conference, radiologists were told that ultra high-frequency sound holds the promise of one day becoming an important and useful diagnostic tool.

The prediction was made by Dr. Douglass H. Howry, radiologist at the University of Colorado School of Medicine, who has been working with sound waves for the scanning of soft tissues for 11 years.

Dr. Howry gave the society's memorial lecture honoring Dr. Raymond R. Lanier, Professor of Radiology at C. U. who was killed last fall while on a hunting expedition in northern Colorado.

Sound Reflection Is Key

Principles underlying the use of high-frequency sound in scanning soft tissues of the body are the same as those employed in World War II to detect the presence of underwater craft, that is, sound wave reflection through water.

Sound used is in the range from 500,000 to 20,000,000 cycles per second, depending on the site and the tissue under examination.

An important advantage to sound is that waves of this frequency cause no tissue damage and induce no genetic effects, Dr. Howry said.

The fact that high-frequency sound waves travel readily only through water or a solid medium and not through air means that patients must be immersed in a tub of water along with the sound source—a quartz transducer that converts electric energy to sound.

For patients who are too ill to be placed in the tub and for patients undergoing scanning of the head and neck areas, Dr. Howry and his group have designed a tub with a transparent plastic panel in the side against which the patients may be positioned. The sound source remains inside the tub, but the plastic panel assures that there is no air between it and the target.

An innovation in the technic, Dr. Howry said, has been to rotate the sound source on a track around the patient through arcs ranging from 120° to a full circle. This presents on the oscilloscope a picture more easily recognizable in terms of anatomy.

A time exposure camera focused on the oscilloscope screen makes a cumulative record of the picture obtained.

In his talk, Dr. Howry showed slides made from some of these pictures. They included cross-section scans of the liver, neck, breast, brain, and leg. Anatomic landmarks were clearly visible.

Dr. Howry said high-frequency sound scanning is not sufficiently developed to be recommended for general diagnostic work. But he is interested, he said, in encouraging at least a few other centers in employing it to check his work and make further contributions to technic. He estimated cost of equipment would range from \$20,000 to \$50,000.

Certifying Board for General Practitioners Proposed

According to the statement made by Dr. V. L. Schlaser of Des Moines, Iowa and published in the September 1959 *Journal of Iowa State Medical Society* the Board for the certification of general practitioners, if and when it is established, will in no way replace the American Academy of General Practice, but will serve as an added incentive for future general practitioners.

The primary purpose of a Board of General Practice would be to encourage, recognize and reward fully adequate preparation and education of physicians for general practice. The method for its organization has been established by the Advisory Board for Medical Specialties and the American Medical Association. No deviation from this prescribed method is permitted, and therefore the Academy itself could never become a board.

The trend toward certification has accelerated very considerably in recent years. In fact, more than half of all board-certified physicians have become such since 1950.

The medical student cannot help being influenced by the predominantly specialist-oriented teaching in medical schools. In the entire period of his undergraduate and graduate training, the student physician has very little opportunity for contact with general practitioners. Some medical schools are attempting to increase this contact of students with general practitioners by having students serve preceptorships. A few medical schools, where possible, have established departments or sections of general practice.

The preferential treatment accorded to board-certified physicians in the Armed Forces and Veterans Administration is well known. Discriminatory practices employed by the United Mine Workers of America, denying patients a "free choice of physician," have been well publicized. The Medical Institute of Meat Cutters Local 88, of St. Louis, contends that it permits a free choice of physician, but according to a statement from an

officer of the organization . . . "Physicians must be local medical society members, must be faculty members of at least one of the two university medical schools in the St. Louis area, must be in private practice, must be board-certified in their specialty and must be a private hospital staff member." That seems a far cry from free choice of physician.

It is evident that board certification has become identified, in the minds of many people both in and out of medicine, with competence

in medical practice. Thus, the medical student is impressed with the stature, prestige and favored financial position of the certified specialists, and it is only natural that his first goal is a diploma from his medical school and his second goal is certification by the board of his choice. Therefore, if board certification is the standard used as a means of comparison, the establishment of a Board of General Practice is a possible means of helping general practice and potential future general practitioners.

NOW AVAILABLE . . .

Preliminary prospectus of the 3rd International Congress of Physical Medicine scheduled for Washington, D. C., August 21-26, 1960.

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To stimulate interest in the field of physical medicine and rehabilitation, the American Congress of Physical Medicine and Rehabilitation will award annually, a prize for an essay on any subject relating to physical medicine and rehabilitation. The contest, while open to anyone, is primarily directed to interns, residents, graduate students in the pre-clinical sciences and graduate students in physical medicine and rehabilitation. The Essay Award Committee suggests that members of the American Congress and American Academy of Physical Medicine and Rehabilitation bring this announcement to the attention of interested persons. The following rules and regulations apply to the contest:

1. Any subject of interest or pertaining to the field of physical medicine and rehabilitation may be submitted.
2. Manuscripts must be in the office of the American Congress of Physical Medicine and Rehabilitation, 30 N. Michigan Ave., Chicago 2, not later than March 1, 1960.
3. Contributions will be accepted from interns, residents, graduate students in the pre-clinical sciences, and graduate students in physical medicine and rehabilitation.
4. The essay must not have been published previously.
5. The American Congress of Physical Medicine and Rehabilitation shall have the exclusive right to publish the winning essay in its official journal, the **ARCHIVES OF PHYSICAL MEDICINE AND REHABILITATION**.
6. Manuscripts must not exceed 3000 words (exclusive of headings, references, legends for cuts, tables, etc.), and the number of words should be stated on the title page. An original and one carbon copy of the manuscript must be submitted.
7. The winner shall receive a cash award of \$200.
8. The winner shall be determined by the Essay Award Committee composed of four members of the American Congress of Physical Medicine and Rehabilitation.
9. All manuscripts will be returned as soon as possible after the name of the winner is announced.
10. The American Congress of Physical Medicine and Rehabilitation reserves the right to make no award if, in the judgment of the Essay Award Committee, no contribution is acceptable. Announcement of the winner will be made at the annual meeting.

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3. *Contributions will be accepted from medical students only.*
4. The American Congress of Physical Medicine and Rehabilitation shall have the exclusive right to publish the winning essay in its official journal, the *Archives of Physical Medicine and Rehabilitation*.
5. Manuscripts must not exceed 3000 words (exclusive of headings, references, legends for cuts, tables, etc.), and the number of words should be stated on the title page. An original and one carbon copy of the manuscript must be submitted.
6. The essay must not have been published previously.
7. The winner shall receive a cash award of \$100.
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9. All manuscripts will be returned as soon as possible after the name of the winner is announced. The winning manuscript becomes the exclusive property of the American Congress of Physical Medicine and Rehabilitation.
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3rd International Congress of Physical Medicine
IIIe Congres international de Medecine Physique
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The Mayflower
August 21-26, 1960

WASHINGTON, D. C., U.S.A.

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